MATHEMATICS

Activity Book

Grade 5

Progressive Education Network

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Date: ____________ Day: __________

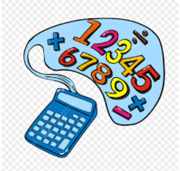
Table of Contents

Sr.	Unit	Page
1	Whole Numbers and Operations Number up to one million Addition and Subtraction Multiplication and Division Number Patterns	4-34
2	HCF and LCM Highest Common Factor (HCF) Least Common Multiple (LCM) Word Problems	35-50
3	Fractions Addition and Subtraction of Fraction Addition and Subtraction of mixed Fraction Multiplication of Fraction Division of Fractions Word problems	51-72
4	Decimals and Percentages Recognizing and identifying decimal Comparing and ordering decimal Addition and Subtraction of Decimals Multiplication of Decimal by 10, 100, 1000 Division of Decimal numbers Conversion of Fraction into Decimals Rounding off Decimals and Estimation Percentages	73-104
5	Distance and Time Conversion of Units of Distance Conversion of kilometers to metres and vice versa Conversion of meter into centimeters and vice versa Conversion of centimeters into millimeters and vice versa. Addition and subtraction in distance/length Real Life Problem involving conversion, addition and Subtraction of unit of distance Conversion of Units of Time Convert Years to Months, Months to Days and vice versa. Addition and Subtraction of Time Real Life Problem involving conversion, addition and Subtraction of units of time	105-123

Date: ____________ Day: __________

6	Unitary Method Calculate the value of many objects of the same kind when the value of one is given Calculate the value of a number of same type of objects when the value of another of the same type is given:	124-130
7	Geometry Recognize Angles Construction of angles by using Protractor Pairs of Angles Triangle Types of Triangles with respect to their sides Types of Triangles with respect of their angles Construction of Triangle Quadrilaterals Construction of a square and rectangle with given sides. Symmetry Nets of 3-D shape	131-173
8	Perimeter and Area Open and Closed figure Area and Perimeter Area and Perimeter of a Square and Rectangle Solve real-life problems of perimeter and area.	174-189
9	Data Handling Average Solve real life problems involving average Organize the data using Bar graph Read and interpret a bar graph given in horizontal and vertical form. Draw horizontal and vertical bar graphs for given data. Solve real life situation using data presented in graphs	190-206
	GLOSSARY	207

Date: ____________ Day: __________



Unit #1: Whole Numbers and Operations

Learning Outcomes:

After Completing these activities, students will be able to:

- **Read number one to 1 000 000 in numerals and words.**
- **Write number one to 1 000 000 in numerals and words.**
- **Add numbers up to 6-digit numbers.**
- **Subtract numbers up to 6-digits numbers.**
- **Multiply numbers, up to 5- digit, by 10, 100 and 1000.**
- **Multiply numbers, up to 5- digits by a number up to 3-digit numbers.**
- **Divided a number, up to 5- digit, by 10, 100 and 1000.**
- **Divided number up to 5- digit by a number up to 2-digit number.**
- **Solve real-life situation involving operations of addition, subtraction, multiplication, and division.**
- **Identify and apply a pattern rule to determine missing elements for a given pattern.**
- **Identify the pattern rule of a given increasing and decreasing pattern and extend the pattern for the next three terms.**
- **Describe the pattern found in a given table or chart.**

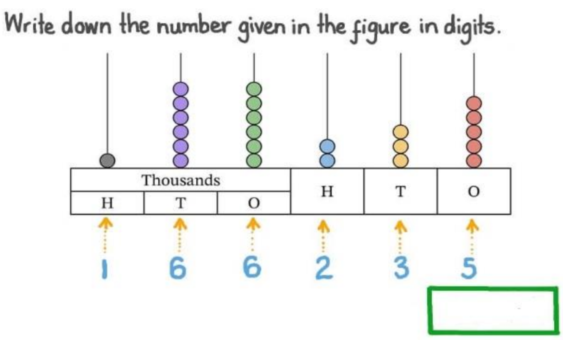
Topic: Number up to one Million

Let's learn:

Numbers can be written in 2 ways – FIGURES/ NUMERALS and WORDS.

Figures/ Numerals use 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. Examples include 34, 1063, 0.75, 25. The number which are greater than three digits, we leave space after every three digits from the right side of that number. Example 7 364 852, 9 654 159 and 753 147 etc.

Activity 1(a)



Date: ____________ Day: __________

Words use letters, and usually take longer to write. Examples include twelve, seventy-one and one million.

467 350 → Four hundred sixty- seven thousand three hundred fifty.

Method of writing figure/numerals into words

Figures are made up of digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) and are usually easy to write, but can be tricky to say or write in words.

To put figures into words, we must try to imagine that the number is in a Place Value table like this one.

> Key facts:
>
> 9 999 999 is the greatest seven-digit number.

Millions			Thousands			Ones		
Hundred millions	Ten millions	Millions	Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	ones

Place value can be defined as the value represented by a digit in a number based on its position in the number. The international system of numeration has three places for each period.

Periods

Milion | Thousand | Ones

Reading and writing of a number "24 567 189"

Millions	Thousands	Ones
24	567	189

In words: read together along with its

Twenty four million, five hundred sixty seven thousand and one hundred eight nine.

Note: When reading a number, all the digits in the periods are read together along with its period (except the ones).

List use a place value chart to write a number in words and numerals?

Millions	Hundred Thousand	Ten Thousand	Thousands	Hundreds	Tens	ones
3	4	5	1	9	8	2

Date: ____________ Day: __________

Place value of each: There are 3millions, 4 hundred thousands, 5 ten thousand, 1 thousand, 9 hundreds, 8 tens and 2 ones in the number.

We write is as:

In words: Three million, four hundred and fifty one thousand, nine hundred and eighty two.

In figure/numeral or standard form:

3 451 982.

Figures form is also called the standard form.

Let's look at the place value of each digit in the number 3 451 982.

Digit 3 is in millions place It has a value of 3 000 000.
Digit 4 is in hundred thousands place It has a value of 400 000
Digit 5 is in ten thousands place It has a value of 50 000
Digit 1 is in thousands place It has a value of 1 000
Digit 9 is in hundreds place It has a value of 900
Digit 8 is in tens place It has a value of 80
Digit 2 is in ones place It has a value of 2

3 451 982 = 3 000 000 + 400 000 + 50 000 + 1 000 + 900 + 80 + 2

This is called expanded form.

Writing a number as a sum of the place values of all its digits is called expanded form of place the number.

Activity 1(b)

Identify the place value of all digits in 124 756.

There are _______ hundred thousands _________ ten thousands, ____________ thousands, _________hundreds, _________ten and ________ ones.

Complete the place value table for 9 871 203 and write it in expanded form.

Millions	Hundred Thousands	Ten Thousands	Thousands	hundreds	Tens	ones

9 000 000 + _____________ + ____________ + __________ + 200 + 0 + ______.

Write 935 432 in words.

____

Date: ____________ Day: __________

EXERCISE 1A

1. **Separate the periods of the following numbers.**

a) 45672 ____________________ **f) 612345** ____________________

b) 2670273 ____________________ **g) 5678** ____________________

c) 296127 ____________________ **h) 888** ____________________

d) 10000000 ____________________ **i) 614532** ____________________

e)9923456 ____________________ **j) 2803**

2. **Write the following number in words.**

1. 938 208 =

____

____

2. 120 540 =

____

____

3. 674 006 =

____

____

4. 503 020 =

____

____

5. 999 999 =

____

____

Date: ____________ Day: __________

6. 3 690 132 =

____

____

7. 19 412 =

____

____

3. Write the following in expanded form.

a) 4 359 348 =

b) 943 029

c) 440 404 =

d) 9 999 =

e) 530 370 =

4. Write the place and place value of each underlined digits.

Number	Place	Place value
678 9<u>8</u>6	8 is at tens	8x10 = 80
72<u>3</u> 592		
<u>4</u>56 321		
196 72<u>2</u>		
2<u>5</u>3 654		

Date: ____________ Day: __________

5. **Write the following in standard form.**

a) Eight hundred twenty-two thousand ninety-nine. _______________________

b) Seven hundred twelve thousand ninety-nine. _________________________

c) Three million sixty-five thousand four hundred eighty-one. __________________

d) Five million one hundred thousand two hundred seven. ___________________ .

e) Four million two hundred five thousand one hundred thirty-six. _________________.

6. **Complete the following.**

No.	Number	M	H-Th	T-Th	Th	H	T	O
(i)	Five million three hundred twenty-five thousand, seven hundred fifteen	5	3	2	5	7	1	5
(ii)	One million one hundred thousand one hundred eight two							
(iii)	Nine hundred twelve thousand five hundred one							
(iv)	Five million five hundred million							
(v)	Seven million eight hundred and sixty four							

7. **Fill in the missing numbers.**

a) 359 348 =

___________ + ____________+____________+____________+___________+__________

b) ___________ =

800 000 + 50 000 + 0 + 100 + 0 + 4

c) 440 404 =

___________ + ____________+____________+____________+___________+__________

d) __________ =

900 000 + 90 000 + 9 000 + 900 +90 + 9

e) 530 370 =

___________ + ____________+____________+____________+___________+__________

Date: ____________ Day: __________

8. In the number 8 452 960.

a) The digit is in the ________ is in the ten thousands place.

b) The place value of the digit 8 is ____________.

c) The place value of the digit 4 is ____________.

d) The digit 9 is in the _______ place.

e) The digit _____ is in the tens place.

9. Fill in the blanks.

(1) The greatest 4- digit number is _9 999.

(2) The smallest 5- digit numbers is __________.

(3) The greatest 5-digit number is ___________.

(4) The greatest 6-digit number is _____________.

(5) The smallest 3-digit number is _____________.

Key fact:

1 000 000 is the smallest its 7-digit number.

10. Match column A with column B.

Column A	Column B
Six thousand four hundred and thirty	1 000 007
Two million four hundred and ninety five	70 300
One million and seven	6 430
Seventy thousand three hundred	489 873
Four hundred eighty-nine thousand eight hundred and seventy-three	2 000 495

CHALLENGE

Which number am I?

Mr. Livingston has a secret number find the number. If it has the following clues:

1. Rounded to one significant figure, the number is 100 000.
2. The number has 7 thousand.
3. It has 9 in its one digit as well as in its hundreds digit.
4. The number has 8 tens.
5. To the nearest thousand, the number can be rounded to 15,000.

Date: ____________ Day: __________

Unit #1: Whole Numbers and Operations

Topic: Addition and Subtraction

Let's learn:

Addition

We have learnt to add up to 5-digit numbers. Let us revise. An example is the addition of 35436 with 43968.

	TTh	Th	H	T	O
		1	1	1	
	3	5	4	3	6
+	4	3	9	6	8
	7	9	4	0	4

Let's apply this rule to 5-digit numbers.

Example 1: Add **85765** and **37071**

Solution:

	T-Th	Th	H	T	O
	①		①		
	8	**5**	**7**	**6**	**5**
+	**3**	**7**	**0**	**7**	**1**
	1 2	**2**	**8**	**3**	**6**

Step1: Add ones
5 + 1 = 6 ones

Step2: Add tens
6 + 7 = 13 tens
write 3 below tens and carry 1 to hundred column

Step3: Add hundreds
1 + 7 + 0 = 8 hundreds

Step4: Add thousands
5 + 7 = 12 thousand,
write 2 below thousand and carry 1 to ten thousand column.

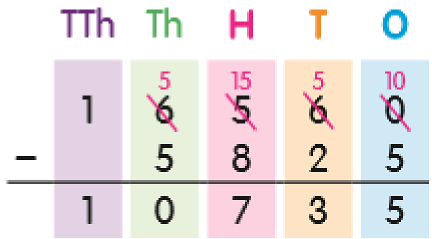
Step5: Add ten thousands
1 + 8 + 3 = 12T-Th
write 12 below T-Th

Hence 85765 + 37071 = 122836

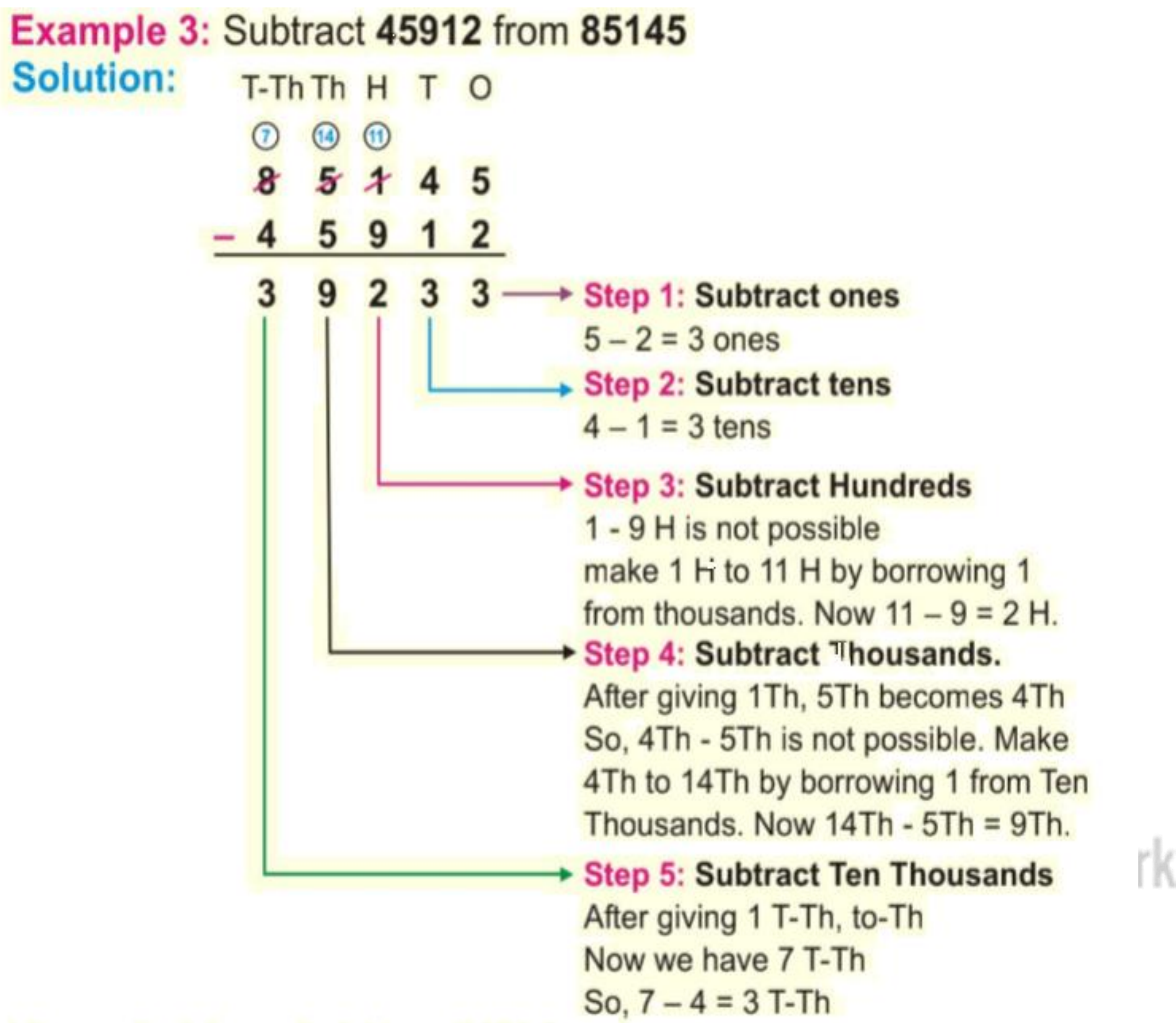
Always remember: Start from one. Add ones first, then tens, then hundreds, then thousand and then ten thousand in the last

Subtraction

Just like subtraction we have learnt in to subtract up to 5-digit numbers. An example is the subtract 5825 from 16560.



Let's apply this rule to 5-digit numbers.



Key Facts: If 1 is subtracted from a number the answer is its predecessor of the dived number.

Example: 8 731 094 – 1 = 8 731 093

The predecessor is a number that comes before the given number.

Date: ____________ Day:__________

EXERCISE 1 B

1. **Add the following:**

a) 254 352+111 684

	H-Th	T-Th	Th	H	T	O
	2	5	4	3	5	2
+	1	1	1	6	8	4

b) 578296 + 678246

c) 674 592 + 862 934

d) 947 542 + 652 964

e) 600 075 + 564 938

f) 496 505 + 315 273

g) 48 793 + 67 485

h) 653 908 + 845 873

Date: ____________ Day:__________

2. Subtract the fowling:

a) 574 965 – 543 227

	H-Th	T-Th	Th	H	T	O
	5	7	4	9	6	5
-	5	4	3	2	2	7

b) 565 873 – 381 651

c) 714 341– 122 938

d) 889 226 –738 245

e) 845 318 – 456 051

f)926 584 – 583 6

Date: ____________ Day:__________

Word problems on Addition and Subtraction of large numbers:

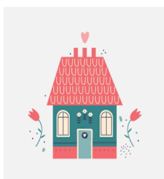
Solve the word problems, and write the answer by making a place value chart.

a) A milk-dairy produces 253 545 liters of milk every day. It supplies 154 625 liters of milk to a milk-depot and the rest to the market. How much milk is supplied to the market?

b) 1. In an examination, 752 236 students passed and 140 892 students failed. Find how many students appeared for the examination.

c) The town of Sterling recycled 385,395 aluminum cans in January of 2010. It recycled 562,543 cans in March of 2010. How many more cans were recycled in March than in January?

d) The house on Usmani Road sold for Rs. 119,673 less than the house on Canal Road. If the house on Canal Road sold for Rs. 475,006, how much did the house on Usmani Road sell for?



Date: ____________ Day:__________

e) Mr. McAuley's car been driven 249,107 miles - more than the distance between the Earth and Moon. If the distance between the Earth and Moon is 238,857 miles, how many more miles has the car been driven?

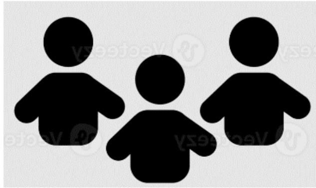
f) In 2010, the city of Kansas City, Missouri had a population of 459,787. In 1990, its population was 435,187. How much larger was Kansas City's population in 2010, than in 1990?

g) Mrs. Stoller reads a lot of books. In her lifetime, she has read 361,045 pages in her life (just in books). Mr. Stoller also reads a lot of books. He has read 481,589 pages in his life. How many more pages has Mr. Stoller read than Mrs. Stoller?

h) The population of Columbus, Ohio is 787,033. The population of Cleveland, Ohio is 396,816. How many more people does Columbus have than Cleveland?

Date: ____________ Day:__________

i) MNussbaum.com had 595,760 visitors in January of 2011, and 615,355 in February of 2011. How many more visitors came in February than January?



j) Farmer Travis grew 195,604 carrots in 2009. In 2010, he grew 267,002 carrots. How many more carrots did he grow in 2010?

Do you know?

9 + 1 = 10

99 + 1 = 100

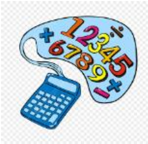
999 + 1 = 1 000

9 999 + 1 = 10 000

99 999 + 1 = 100 000

999 999 + 1 = 1 000 000

Date: ____________ Day:__________



Unit #1: Whole Numbers and Operations

Topic: Multiplication and Division

Let's learn:

Multiplication

Multiplication is an arithmetic operation for finding the product of two numbers. As we know that multiplication is the process of repeated addition.

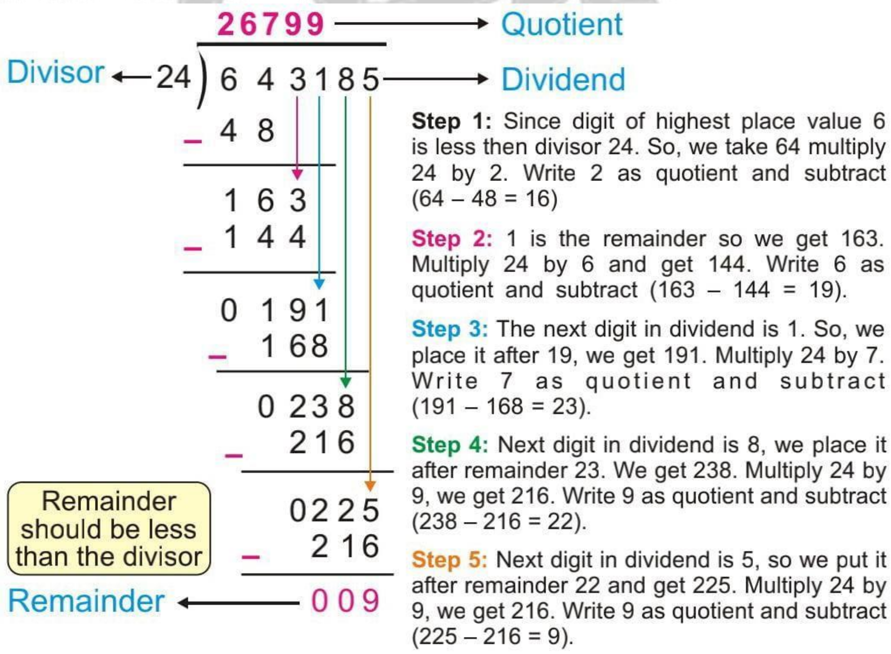
It is a quick way to put equal numbers together. An Example of multiplication is **154205 by 241.**

```
      1 5 4 2 0 5
          × 2 4 1
-----------------
      1 5 4 2 0 5
    6 1 6 8 2 0 0
  3 0 8 4 1 0 0 0
-----------------
  3 7 1 6 3 4 0 5
-----------------
```

Division

We have learnt divided 4-digits by 2-digits numbers. Division in math is the process of breaking a number up into equal parts, and finding out how many equal parts can be made. For example, dividing 15 by 3 means splitting 15 into 3 equal groups of 5

It is a quick way to separate equal parts of a number. An Example of division is **643 185 by 24.**



Hence quotient is **26,799** and remainder is **9**.

Date: ____________ Day:__________

MULTIPLICATION AND DIVISION BY 10, 100, 1000

x 10	move digits one place to left
x 100	move digits two places to left
x 1000	move digits three places to left
÷ 10	move digits one place to right
÷ 100	move digits two places to right
÷ 1000	move digits three places to right

Activity 1(c)

Multiplication by 10s 100s and 1000s

×10	×100	×1000
45= 450	76= 7600	54= 54000
67= _____	65=_______	87=_________
55=______	54=_______	35=__________

.

Date: ____________ Day:__________

Activity 1(d)

Division by 10 100 and 1000s

÷10	÷100	÷1000
45 000=_____	76 000=____	54 000=____
67 000= ____	65 000=____	87 000=____
55 000=_____	54 000=____	35 000=_____

EXERCISE 1-C

1. **Solve:**

a) 435 × 72

b) 325 × 54

c) 394 × 45

d) 1 632 × 23

e) 6 314 × 52

f) 34 251 × 32

g) 63 578 × 80

h) 25 839 × 33

2. Multiply the following.

a) 1092 × 981

	B	TTM	TM	M	H-Th	T-Th	Th	H	T	O
							1	0	9	2
×								9	8	1

Date: ____________ Day:__________

b) 1 392 × 271

c) 58 549 × 128

d) 4 021 × 108

e) 65 483 × 126

f) 790 902 × 643

g) 356 219 ×101

3. **Divide the following.**

a) 4 920 ÷ 12

b) 8268 ÷ 15

$12\sqrt{4\,920}$

c) 6 275 ÷ 25

d) 3 289 ÷ 11

e) 28 896 ÷ 42

f) 41 712÷ 12

Date: ____________ Day:__________

g) 38 082 ÷ 22

h) 422 360 ÷ 20

Word problems on multiplying and dividing of large numbers:

Example: Faraz earns Rs. 16 540 in a month. How much money will he earn in 2 years?

Solution: 2 years = 24 months

		②	②	①		
Earning in a month		1	6	5	4	0
Number of months				x	2	4
		6	6	1	6	0
	+ 3	3	0	8	0	0
Total Amount	3	9	6,	9	6	0

Hence Faraz will earn **Rs 396,960**

Solve the word problems, and write the answer by making a place value chart.

1. The cost of a chair is Rs.980. Find the cost of such 2035 chairs.

2. A tire factory produces 6348 tires a day. How many tires will the factory produce in 460 days?

Date: ____________ Day:__________

3. The cost of a flat is Rs.4218000. If there are 36 similar flats in a building, how much money will be collected by selling all the flats?

4. 470988 books are to be arranged equally in shelves. If 378 books are arranged in each shelf, how many shelves will be needed?

5. The cost of 534 train tickets was Rs.457104. Find the cost of one ticket.

6. Find Quotient and remainder when divisor is 35 and divided is 507

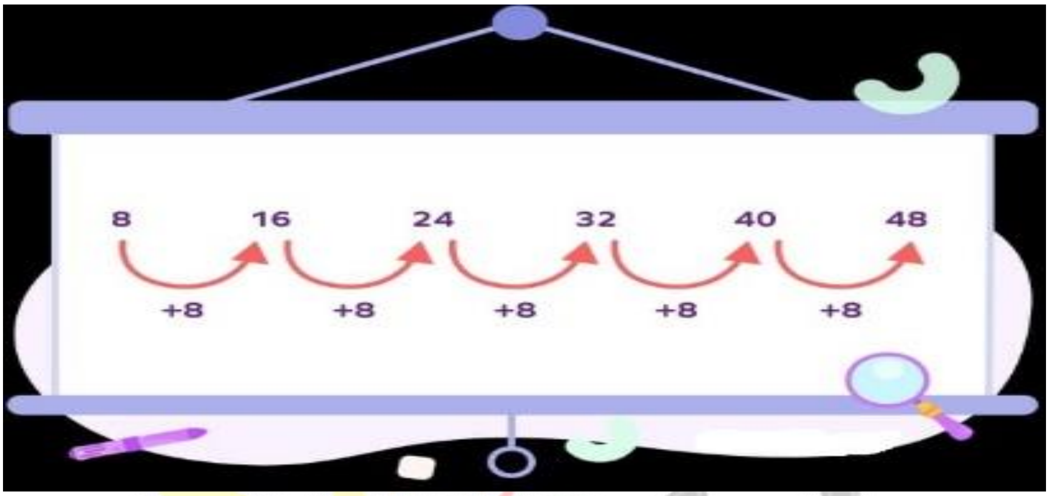
Date: ____________ Day:__________

Unit #1: Whole Numbers and Operations

Topic: Number Patterns

Let's learn:

In Mathematics, Number Patterns are the patterns in which a list of number that follow a certain sequence. Generally, the patterns establish the relationship between two numbers. It is also known as sequences of series in numbers.



Each number in a sequence is called a term. The first term of this pattern is 8 the next term is 16 and so on. Terms that follow each other are called consecutive terms. 8 and 16 are consecutive terms, 16 and 24 are consecutive and so on. Each term is 8 more than the term before so the rule of the sequence is "Add 8".

Example:

a) Write down the rule and the next two terms of the sequence. 2, 6, 10, 14, _____, _____.

The rule is 'Add 4'.	You can see that the terms are going up by 4 every time as 2 + 4 = 6, 6 + 4 = 10 and 10 + 4 = 14.
Next two terms are 18 and 22.	You keep adding 4 to find the next two terms: 14 + 4 = 18 and 18 + 4 = 22.

b) The first term of a sequence is 5. The rule of the sequence is: 'multiply by 2 and add 1'. Write down the first three terms of the sequence.

First three are 5, 11, 23	Write down the first term, which is 5, then use the rule to work out the second and third terms. Second term = 2×5 + 1 = 11, third term = 11×2 +1 = 23.

Date: ____________ Day:__________

EXERCISE 1D

1. **Complete the given pattern and also find the rule:**

(i) 5, 20, 10, 30, 15, 40, ________, _________, ____________

(ii) 1, 3, 5, 7, 11, ________, _________, ____________

(iii) 5, 8, 11, 14, 17, ________, _________, ____________

(iv) 6, 95, 7, 90, 8, 85, ________, _________, ____________

(v) 1, 5, 25, 125, ________, _________, ____________

(vi) 800, 400, 200, 100, ________, _________, ____________

(vii) 2, 6, 18, 54, ________, _________, ____________

(viii) 1, 4, 9, 16, 25, ________, _________, ____________

(ix) 99999, 9999, 999, ________, ________, __________

2. **Describe the rule for each sequence below and find the next term:**

a)2, 3, 5, 8 . . .

b) 5, 15, 35, 65 . . .

c)3, 4, 7, 12 . . .

d) 6, 8, 12, 18 . . .

e) 100, 99, 97, 94 . . .

f) 5, 6, 8, 12 . .

3. **Each sequence below increases/decreases by the same amount each time. Find the missing terms.**

a) 4, ___, 8, 10 . . .

b) 2, 5, ___, 11 . . .

c) 5, 9, ____, 17 . .

d) 25, ____, 37, 43

e) 15, 24, ___, 42 .

f) 34, ___, 24, 19 . .

g) 18, ___, 40, 51 .

h) 1, ___, ____, 19.

i)3, ___, ___, 27 . .

j)18,___, ___ , 39, .

k) 6, ___, ____, ____, 42,

CHALLENGE

Use the numbers in the circle to make a number pattern

45 75 85 95 55 65

________, ________, ________, ________, ________.

Date: ____________ Day:__________

4. **Study the pattern and find the rule. One has been done for you.**

i)

Multiply by 2	
1	**2**
3	**6**
5	**10**
7	**14**

ii)

2	**5**
4	**7**
7	**10**
11	**14**

iii)

1	**9**
3	**10**
5	**13**
7	**15**

5. **Use the rule and then apply the rule to position 20.**

Position	1	2	3	4	5	20
Rule						
Number pattern	**6**	**12**	**18**	**24**	**30**	

Position	1	2	3	4	5	20
Rule						
Number pattern	**1**	**3**	**6**	**10**	**15**	

Position	1	2	3	4	5	20
Rule						
Number pattern	**1**	**8**	**27**	**64**	**125**	

Position	1	2	3	4	5	20
Rule						
Number pattern	**7**	**9**	**11**	**13**	**15**	

Date: ____________ Day:__________

REVIEW EXERCISE 1

1. Tick (✓) the correct options.

1. We put space after every ________ digit in numbers.

a. 2 b. 3 c. 5 d. 6

2. The place value of 2 in the number 985 621 is _____________.

a. 2 b. 20 c. 200 d. 2 000

3. In 856 211, the digit _______ is at thousand place.

a. 2 b. 5 c. 6 d. 8

4. when we multiply a number by______, we put 3 zeros to the right side.

a. 10 b. 100 c. 1000 d.1

5. When we divide a number by _____ we remove one zero from the right side.

a. 10 b. 100 c. 1 000 d. 1

2. Write the following numbers in words:

a) 734 123=

____

____

b) 965 129=

____

____

c) 982 009=

____

____

d) 912 011=

____

____

3. Solve the following:

a)212 121 + 56 234 **b)18 315 + 102 376**

Date: ____________ Day:__________

c)18 315 + 102 376

d)727 191 + 92 921

e) 200 454 + 126 654

f) 532 481 + 100 008

4. **Find the difference.**

a)675 921 – 31 412

b)986 543 – 65 219

c) 865 439 – 761 212

d) 696 349 – 288 888

e) 108 761 – 70 021

f) 846 109 – 591 089

Date: ____________ Day:__________

5. **Perform the following**

a) 12 356 × 122

b) 262 825 × 522

c) 61 243 × 100

d) 962 345 × 45

6. **Find the quotient and also write the remainder if any.**

a) 561 ÷ 11

b) 6 744 ÷ 12

c) 3 920 ÷ 16

d) 28 104 ÷ 28

e) 58 580 ÷ 10

f) 269 817 ÷ 356

Date: ____________ Day:__________

7. **What are the rules for these patterns? Also find the next three terms of each pattern.**

a) 50, 100, 150, 200, _______, _______, _________.

b) 180, 165, 150, 135, _______, _______, _________.

c) 18, 90, 450, 2 250, _______, _______, _________.

d) 6 100 000, 610 000, 61 000, _______, _______, _________.

8. **Find the patterns in the given arithmetic sentences and complete them.**

a)

10 × _______= 10

10 × _______= 100

10 × _______= 1 000

10 × _______= 10 000

b)

______÷ 10 = 1 000

______÷ 10 = 1 00

______÷ 10 = 1 0

______÷ 10 = 1

9. **The price of a shop is Rs.456 721 and the price of a flat is Rs. 456 721 and the price of a flat is Rs. 987 676. Find the total price of the shop and the flat.**

10. **Their price of a scanner is Rs 162 900 and the price of a laser printer is Rs.96 880. Find:**

a) the total price of both items.

b) the total price of 15 scanners and 3 laser printers.

11. **35 288 blocks are to be packed in 28 boxes. Find:**

a) How many blocks are there in each box?

b) How many blocks will be left?

c) How many blocks will be there in 555 such boxes?

12. **Fill in the missing digits in the following.**

(1)

```
   5 3 6 2 ○ 4
+  3 ○ 3 ○ 2 2
--------------
   8 8 9 6 3 6
```

(2)

```
   3 4 7 8 4 5
+  4 ○ 2 ○ 1 ○
--------------
   7 6 0 1 5 9
```

(3)

```
   5 ○ 3 4 ○ 9 8
-  3 2 ○ 2 3 4 ○
----------------
   2 7 2 2 5 5 4
```

(4)

```
   6 8 1 4 ○ 3 9
-  ○ ○ 0 2 5 2 ○
----------------
   3 4 1 2 2 1 5
```

Date: ____________ Day:__________

13. Observe the given tables and find the rules of pattern given in them.

Position	Term
1	10
2	20
3	30
4	40
5	50

Rule: ____________________________

Position	Term
1	8
2	10
3	12
4	14
5	16

Rule: ____________________________

Rule: ______________________________

Position	Term
1	60
2	48
3	36
4	24
5	12

Position	Term
1	2
2	9
3	16
4	23
5	30

Rule: _________________________________

Date: ____________ Day:__________

Unit #2: HCF and LCM

Learning Outcomes:

After Completing these activities, students will be able to:

- **Find HCF of:**
  - **Two number up to 2-digit numbers.**
  - **Three numbers up to 2-digit numbers**
  - **Using prime factorization method and division method**
- **Find LCM of:**
  - **Two number up to 2-digit numbers.**
  - **Three numbers up to 2-digits numbers**
  - **Using prime factorization method and division method**
- **Solve real-life situation involving HCF and LCM.**

Topic: Highest Common Factor

Let's learn:

A divisibility test is a quick way of testing if a number is divisible by another number without dividing.
Factor of a number is a number that divides the given number completely leaving no remainder.

For example: 32 ÷ 4 = 8   32 ÷ 8 = 4

In both these examples, we can see that the answer is a whole number with on remainder.
A multiple is a product that we get when one number is multiplied by another number. For example, if we say 4 × 5 = 20, here 20 is a multiple of 4 and 5.

The **HCF** is the abbreviation for the highest common factor **(HCF)**

A number is divisible by:

2	if its last digit is even (0, 2, 4, 6, 8).
3	if the sum of the digits is divisible by 3.
4	if the last two digits of a number are divisible by 4.
5	if the last digit is either 0 or 5.
6	if the number is divisible by both 2 and 3.
7	if the last digit of the number is doubled and subtracted from the rest of the number and this difference is divisible by 7.
8	if the last three digits of a number are divisible by 8.
9	if the sum of the digits is divisible by 9.
10	if the number ends with 0.

Date: ____________ Day:__________

The HCF is the largest integer (whole number) that two or more numbers can be divided by.

Method of find HCF:

- Prime factorization
- Division method

> Key Fact: The HCF of two or more than two numbers, which have no common prime factor, is always 1.

Using Prime Factorization of a number to find its HCF:

Number can be expressed as a product of its factors i.e. $30 = 2 \times 3 \times 5$. If all the factors are prime, it is called prime factorization. It can be used to find HCF of a number.

1 Find the HCF of 60 and 75.

$60 = 2 \times 2 \times 3 \times 5$

$75 = 3 \times 5 \times 5$

HCF of 60 and 75 = 3 × 5 = 15

2 Find the HCF of 40 and 48.

2	40,
2	20
2	10
	5

2	48
2	24
2	12
	6

HCF = 2 × 2 × 2 = 8

3 Find the greatest number that exactly divides 135, 180 and 225.

3	135
3	45
5	15
	3

3	180
3	60
5	20
	4

3	225
3	75
5	25
	5

Prime factorization of 135	3 × 3 × 5
Prime factorization of 180	3 × 3 × 5
Prime factorization of 225	3 × 3 × 5
Common prime factor	3 × 3 × 5

HCF of 135, 180 and 225 = 3 × 3 × 5 = 45

Thus, 45 is the greatest number that exactly divides 135, 180 and 225.

Division Method: When the numbers whose H.C.F. has to be found are very large, it is time-consuming and tedious to use the prime factorization method. In this case, we use the long division method.

In this method, we divide the larger number by the smaller number. If the remainder is zero, then the divisor is the H.C.F.

> Every number greater than 1 has at least two factors 1 and the number itself. A number can be divided by any of its factors without leaving a remainder.

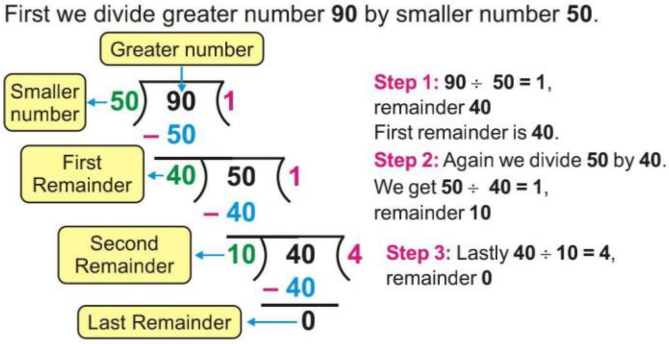
Example 1: Find HCF of **50** and **90** by division method.

Solution:

Given two numbers are **50** and **90**.

Larger number is **90** and smaller number is **50**.

First we divide greater number **90** by smaller number **50**.



Hence, HCF of **50** and **90** = **10**

Date: ____________ Day:__________

EXERCISE 2 A

1. **Find the HCF of the following numbers using Prime Factorization method.**

a) 90 and 120 b) 60 and 84

c) 55 and 110 d) 144 and 198

2. **Find the HCF of the following numbers using Prime Factorization method.**

a) 96, 16 and 24 b) 16, 18 and 22

Date: ____________ Day:__________

c) 66, 88 and 132

d) 15, 21 and 27

3. Find the HCF of the following numbers using Division method.

a) 84 and 144

b) 120 and 168

c) 264 and 250

d) 12, 18 and 24

e) 72, 90 and 126

f) 96, 16 and 24

Date: ____________ Day:__________

Word problems on HCF:

Solve the word problems, and write the answer by making a factor statement.

1. Two wires are 12 m and 16 m long. The wires are to be cut into pieces of equal length. Find the maximum length of each piece.

2. Find the greatest number that divides 90 and 126 exactly.

3. Rachel has 24 red candies and Maya has 18 green candies. They want to arrange the candies in such a way that each row contains equal number of candies and also each row should have only red candies or green candies. What is the greatest number of candies that can be arranged in each row?

Date: ____________ Day:__________

Unit #2: HCF and LCM

Topic: Least Common Multiple (LCM)

Let's learn:

The **LCM** is the abbreviation for the least Common Multiple **(LCM).**

The LCM is the smallest integer that is a multiple of two or more composite numbers (exists within the multiplication table of each number).

LCM of two prime numbers is the product of that numbers. Example LCM of 3 and 7 is 21.

Method of find LCM:

- Listing Multiples Method
- Prime Factorization
- By using Division Method

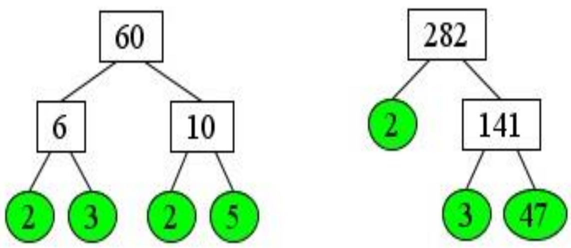
Listing Multiples Method: Suppose we want to find common multiples of 10 and 25. We can list the first several multiples of each number. Then we look for multiples that are common to both lists—these are the common multiples.

10: 10, 20, 30, 40, **50**, 60, 70, 80, 90, **100 … …**
25: 25, **50**, 75, **100**, 125, 175, 200, 225,250 … …

We see that 50 and 100 appear in both lists. They are common multiples of 10and 25. We would find more common multiples if we continued the list of multiples for each.

The smallest number that is a multiple of two numbers is called the **least common multiple** (LCM). So, the least LCM of 10 and 25 is 50.

Prime factorization: Similarly, as in HCF, It can all be used to find LCM of a numbers.



In LCM the product of all the factors common factor should be taken only one.

Key fact: When we multiply any number by any other number, their product is called multiple of that number.

$60 = 2 \times 2 \times 3 \times 5$
$282 = 2 \times 3 \times 47$
Common prime factors 60 and 282= 2×3
Non-common prime factors 60 and 282 = $2 \times 5 \times 47$
LCM = Product of common prime factors × Product of non-common prime factors

LCM $(60,282) = 2 \times 3 \times 2 \times 5 \times 47 = 2820$

- **By using Division Method**

Given numbers are 48, 72 and 108

Factorization of 48, 72 and 108

2	48
2	24
2	12
2	6
3	3
	1

2	72
2	36
2	18
3	9
3	3
	1

2	108
2	54
3	27
3	9
3	3
	1

$$48 = 2 \times 2 \times 2 \times 2 \times 3 = 2^4 \times 3$$

$$72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$$

$$108 = 2 \times 2 \times 3 \times 3 \times 3 = 2^2 \times 3^3$$

LCM = (Product of two or more than two common prime factors) × (Product of two or more than two non-common prime factors

LCM = (2 × 2×2×3×3) × (2× 3)

LCM = 72 ×6= 432

Date: ____________ Day:__________

EXERCISE 2 B

1. **Find the LCM of the following numbers using Prime Factorization method.**

a) 90 and 120

b) 60 and 84

c) 55 and 110

d) 144 and 198

2. **Find the LCM of the following numbers using Prime Factorization method.**

a) 96, 16 and 24

b) 16, 18 and 22

c) 66, 88 and 132 **d) 15, 21 and 27**

3. Find the LCM of the following numbers using division method.

a) 84 and 144 b) 120 and 168 c) 264 and 250

4. Find the LCM of the following numbers using division method.

a) 12, 18 and 24 b) 72, 90 and 126 c) 96, 16 and 24

Date: ____________ Day:__________

Word problems on LCM:

Solve the word problems, and write the answer by making a factor statement.

1. Find the lowest number which is exactly divisible by 18 and 24.

2. Find the lowest number which is less by 5 to be divided by 16, 24 and 36 exactly.

3. Pencils come in packages of 10. Erasers come in packages of 12. Fahad wants to purchase the smallest number of pencils and erasers so that he will have exactly 1 eraser per pencil. How many packages of pencils and erasers should Fahad buy?

4. Find the lowest number which leaves 3 as remainder when divided by 8, 12 and 16.

Date: ____________ Day:__________

5. A shopkeeper sells candles in packets of 12 and candle stands in packet of 8. What is the least number of candles and candle stands Nida should buy so that there will be one candle for each candle stand.

REVIEW EXERCISE 2

1. Tick (✓) the correct options.

1. The HCF of 20, 48 and 56 is ___________.

a. 1 b. 3 c. 4 d. 5

2. The HCF of two or more than two numbers, which have no common prime factor, is always________.

a. 1 b. 10 c. 100 d. 1 000

3. Prime factorization of 16 is ______________.

a. 2 ×8 b. 1× 16 c. 2×2×2×2 d. 2×4×2

4. The LCM of 33, 66 and 81 is ______________.

a. 1770 b. 1 782 c. 1 872 d.1 887

5. The LCM of two or more prime numbers is equal to their _________.

a. prime factor b. quotient c. LCM d. product

Date: ____________ Day:__________

2. Find the HCF of the following numbers using prime Factorization.

a) 15,18 b) 10, 20 c) 56, 88

d) 10, 18, 22 e) 20, 40, 38 f) 39, 51, 75

3. Find the HCF of the following numbers using division.

a) 15,45 b) 20,50

Date: ____________ Day:__________

c) 60,70, 80

d) 22,28,32

e) 44,55,99

f) 26,52,65

Date: ____________ Day:__________

4. Find the LCM of the following numbers using prime factorization.

a) 2,5 b) 3,7 c) 5,8

d) 4,10,16 e) 45, 90, 95 f) 26, 52, 65

5. Find the LCM of the following using division.

a) 4, 9 b)14, 26

Date: ____________ Day:__________

c) 20, 40

d) 6, 24, 42

e) 10, 20, 30

f) 12, 18, 38

Word problems of HCF and LCM:

Solve the word problems, and write the answer by making a factor statement.

1) 84 apples, 56 bananas and 21 oranges were distributed equally among some children. If the same combination of all kinds of fruit is distributed among all the children, find out the maximum possible number of children who can get the fruits?

Date: ____________ Day:__________

2) Three water contains contain 12 liters, 24 liters and 42 liters of water.

a) Find the maximum capacity of a measuring container that can fully measure the quantity of water in all three containers.

b) Find out how many times this container needs to be filled to empty each container?

CHALLENGE

Find three 2-digit numbers whose sum is 152 and whose HCF is 8.

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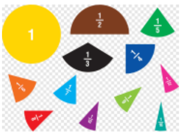


Unit #3: Fractions

Learning Outcomes:

After Completing these activities, students will be able to:

- **Add and subtract two or three fractions with different denominators.**
- **Multiply a fraction by a 1-digit number and demonstrate with the help of diagram.**
- **Multiply two or three fraction involving proper, improper fraction and mixed numbers.**
- **Solve real-life situation involving multiplication of fraction.**
- **Divided a fraction by another fraction involving proper, improper fraction, and mixed numbers.**
- **Solve real-life situation involving division of fraction.**

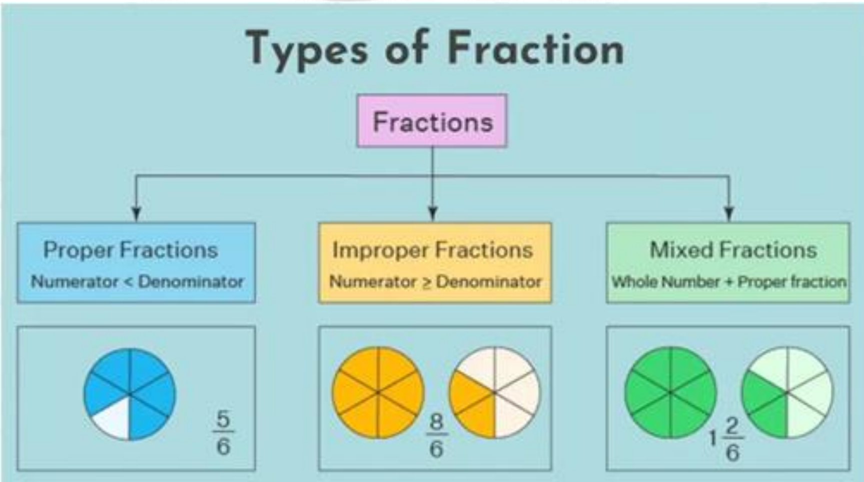
Topic: Addition and Subtraction of Fractions

Let's learn:

Fraction is an equal part of a whole. We get a fraction when we divide a thing into equal parts. Suppose a piece of paper is cut into four equal parts. One of the four piece is given to someone. This piece is one-fourth of the paper and is written as $\frac{1}{4}$. The number 1 is called the numerator and 4 is the denominator.

Types of Fractions:

- Proper Fraction
- Improper Fraction
- Mixed number



Addition of Fractions: When we add the fraction with same denominators, will add their numerations only.

Date: ____________ Day:__________

Example: Add $\frac{3}{8} + \frac{4}{8}$

Solution: $\frac{3}{8} + \frac{4}{8} = \frac{3+4}{8} = \boxed{\frac{7}{8}}$

Activity **Solve:**

(1) $\frac{1}{7} + \frac{4}{7} = \frac{1+4}{7} = \square$

(2) $\frac{4}{9} + \frac{3}{9} = \frac{4+3}{9} = \square$

(3) $\frac{3}{11} + \frac{5}{11} = \frac{3+5}{11} = \square$

Remember in equivalent fraction:

- Take the LCM of denominators.
- Multiply the numerator and denominator by the same number to convert the denominator into LCM.

When we add fraction with unlike denominators, we will first have to convert these fractions into like fraction by taking the LCM of the denominators.

Example 1: Add $\frac{2}{3} + \frac{5}{6}$

Solution: We will first have to convert these fractions into like fractions by taking the LCM of denominators.

$\frac{2}{3} = \frac{2 \times 2}{3 \times 2} = \frac{4}{6}$ ← Using the equivalent fractions method

$\frac{2}{3} + \frac{5}{6}$ → LCM is 6

$= \frac{4}{6} + \frac{5}{6}$ → Now add the numerators

$= \frac{9}{6} = \frac{3}{2} = 1\frac{1}{2}$ ← Always keep your answer in lowest form

Two or more than two fractions whose numerator and denominators are different but they have same values are called equivalent fractions.

Subtraction of Fractions:

Just like addition there are two ways for subtraction. First for like subtraction, and the second one for unlike fraction.

For like fraction: To subtract the fraction having same denominators, we will subtract their numerators only.

Example: subtract $\frac{7}{4} - \frac{5}{4}$

$= \frac{7}{4} - \frac{5}{4}$

$= \frac{7-5}{4}$

$= \frac{2}{4}$

$= \frac{1}{2}$

> Since $\frac{2}{4}$ is not in its simplest we will convert the fraction into simplest form by dividing the numerator and denominators on 2.

For Unlike fraction: We know that while subtracting fraction with unlike denominators we take LCM of the dominators. We do this to convert the denominators into same number. By doing so we will convert them in like fraction a then apply same rules to solve them as like fraction.

Example: subtract $\frac{5}{8} - \frac{1}{2}$

Solution: $\frac{5}{8} - \frac{1}{2}$

Writing equivalent fractions, $\frac{1}{2}$

so, we get $\frac{1 \times 4}{2 \times 4} = \frac{4}{8}$

So, $= \frac{5}{8} - \frac{1}{2}$

$= \frac{5}{8} - \frac{4}{8}$

$= \frac{5-4}{8} = \frac{1}{8}$

Or

$\frac{5}{8} - \frac{1}{2}$

Find the LCM of 8 and 2

$= \frac{5 \times 1 - 1 \times 4}{8}$

$= \frac{5-4}{8}$

$= \frac{1}{8}$

2	8, 2
2	4, 1
2	2, 1
	1, 1

LCM = 2x2x2 = 8

In this example we have use two methods of solving unlike like fraction using the concept of equivalent fraction and LCM of the denominators.

> Key Fact: Always subtract the smaller fraction from the greater fraction.

Date: ____________ Day:__________

EXERCISE 3 A

1. Add the following:

a) $\frac{3}{7}+\frac{5}{7}$ b) $\frac{6}{10}+\frac{3}{10}$ c) $\frac{7}{11}+\frac{2}{11}$

d) $\frac{1}{3}+\frac{1}{2}$ e) $\frac{2}{9}+\frac{3}{4}$ f) $\frac{2}{5}+\frac{1}{3}$

2. Subtract the following.

a) $\frac{5}{6}-\frac{1}{2}$ b) $\frac{7}{8}-\frac{3}{4}$ c) $\frac{4}{5}-\frac{1}{3}$

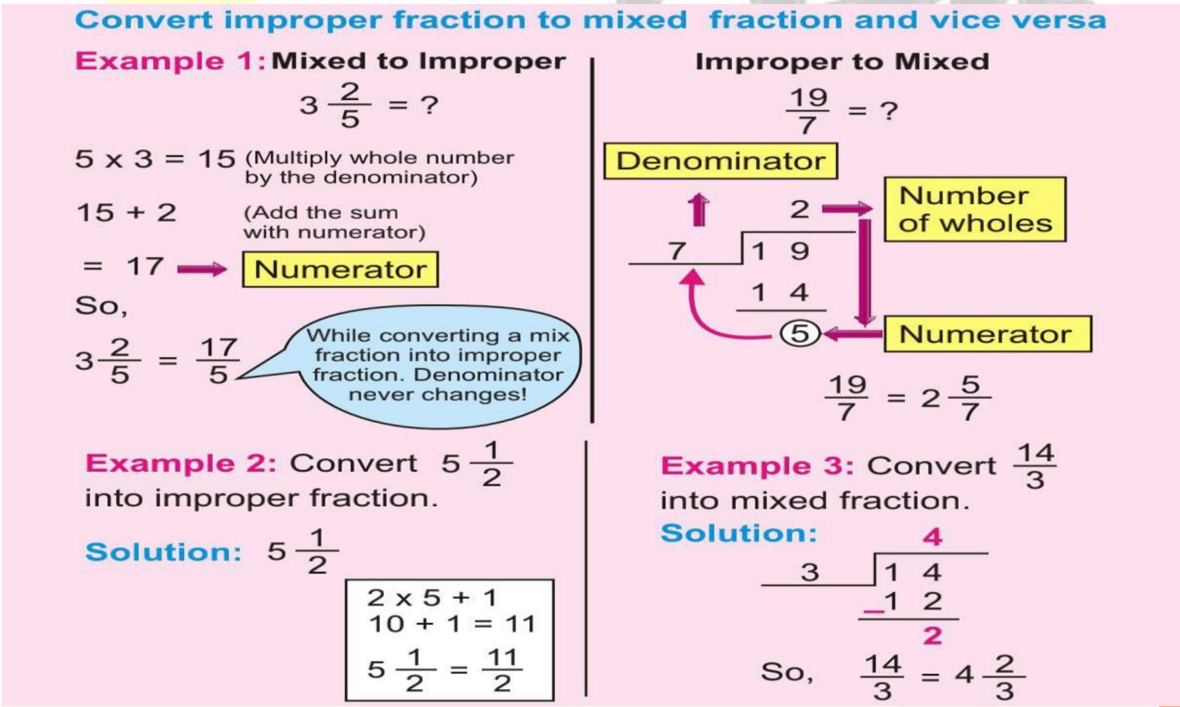
Date: ____________ Day:__________

d) $\frac{3}{7} - \frac{5}{7}$ e) $\frac{2}{9} - \frac{3}{9}$ f) $\frac{5}{12} - \frac{2}{12}$

Topic: Addition and Subtraction of mixed Fraction

Mixed fraction: They are a combination of a proper fraction and a whole number. We use mixed number to represent an improper fraction as a proper fraction. They represent a same amount as the improper fraction. They have 2 parts. To add and subtract a mixed we convert them into improper fraction. As both mixed fraction and improper fraction represent the same value, they can be converted into each other. The process of converting them is as follow. After converting the mixed fraction now, we can add them.

Subtraction of mixed fraction



Date: ______________ Day:___________

Example 2: **Add** $1\frac{3}{5} + 2\frac{1}{10}$

Solution:

$$1\frac{3}{5} + 2\frac{1}{10} = \frac{8}{5} + \frac{21}{10}$$

Convert into improper fractions

$$= \frac{8 \times 2}{5 \times 2} + \frac{21 \times 1}{10 \times 1}$$

Make them like fractions (LCM = 10)

$$= \frac{16}{10} + \frac{21}{10} = \frac{16 + 21}{10}$$

Do the addition of numerators

$$= \frac{37}{10}$$

$$= 3\frac{7}{10}$$

Always keep your answer in lowest form

10) 37 (3
– 30
7

Subtraction of mixed fraction

Example 2: **Simplify** $3\frac{3}{4} - 1\frac{1}{6}$

Solution: $3\frac{3}{4} - 1\frac{1}{6}$

Change to Improper Fractions and then find the LCM of denominators.

$$3\frac{3}{4} - 1\frac{1}{6} = \frac{15}{4} - \frac{7}{6} = \frac{15 \times 3 - 7 \times 2}{12}$$

$$= \frac{45 - 14}{12} = \frac{31}{12} = 2\frac{7}{12}$$

EXERCISE 3 B

3. **Solve the following:**

1. $3\frac{1}{2} + 5$

2. $5\frac{1}{3} + 2\frac{3}{4}$

Date: ____________ Day:__________

3.$\mathbf{2\frac{3}{10} - 1\frac{1}{4}}$

4. $\mathbf{9\frac{1}{2} - 3\frac{1}{5}}$

5.$\mathbf{\frac{2}{3} + 4\frac{1}{2}}$

6. $\mathbf{5\frac{2}{3} - 4\frac{2}{4}}$

Solved the word problem

1. Nasir and his friend jogging on a track. Nasir jogged $7\frac{1}{2}$ km and his friend jogged $4\frac{2}{3}$km. How much more distance did Nasir cover than his friend?

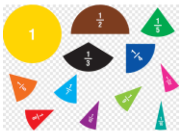
Date: ____________ Day:__________

2. Ali bought $2\frac{1}{2}$ kg of sugar from one shop and $6\frac{2}{3}$ kg of sugar from the other shop. How much sugar did he buy in all?

3. Sajid sold $2\frac{1}{2}$ kg of tomato, $1\frac{3}{8}$kg of onion and $5\frac{1}{4}$ kg of beetroot. How much did he sell?

4. Halima gave $\frac{1}{8}$ part of her money to Tariq. What fraction of money is left with her?

Date: ____________ Day:__________



Unit #3: Fractions

Topic: Multiplication of Fraction

Let's learn:

Multiplication means finding the product of two more fraction. The method of multiplication is different from addition and subtraction of fraction. When a fraction is multiply by another the resultant is either a fraction or a whole number.

Multiplication of fraction includes the following:

Multiplication of fraction with a whole number:

We know that a fraction has two parts a numerator and a denominator. When multiplying a fraction with a whole, we multiply the whole number by the numerator and no change occurs in the denominator. Lastly, we reduce the fraction to its lost form. The following example explain the step-by-step process in detail.

Example 1	**Steps followed**	**Example 2**
$5 \times \frac{3}{4}$		$7 \times \frac{3}{14}$
$\frac{5 \times 3}{4}$	Multiply the whole number with numerator	$\frac{7 \times 3}{14}$
$\frac{15}{4}$	Reduce it if possible	$\frac{\not{21}}{\not{14}}\ \frac{3}{2}$
$3\frac{3}{4}$	Write the fraction in its simplest from	$\frac{3}{2}$

Multiplication of two or more fraction:

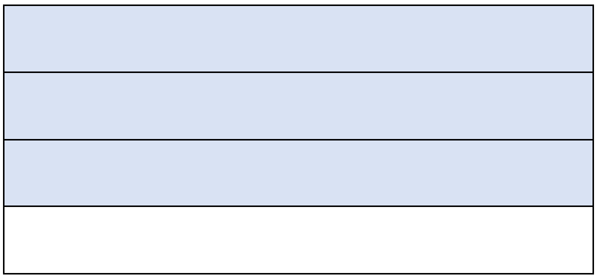
Example 1	**Steps followed**	**Example 2**
$\frac{1}{4}\ of\ \frac{3}{4}$		$\frac{2}{9}\ of\ \frac{3}{5}\ of\ \frac{1}{2}$
$\frac{1}{4} \times \frac{3}{4}$		$\frac{2}{9} \times \frac{3}{5} \times \frac{1}{2}$
$\frac{1 \times 3}{4 \times 4}$	Multiply the numerator and denominators with on and other.	$\frac{2 \times 3 \times 1}{9 \times 5 \times 2}$
$\frac{3}{16}$	Reduce the fraction if possible	$\frac{6 \div 6}{90 \div 6}$
$\frac{3}{16}$	Write the fraction in its lowest from	$\frac{1}{15}$

Date: ____________ Day:__________

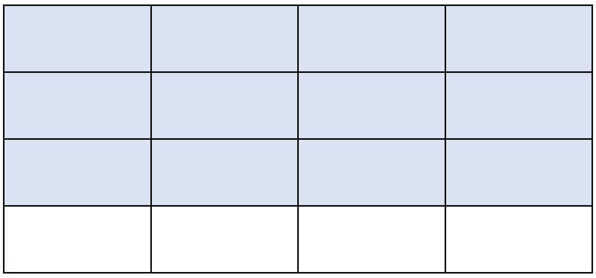
Using pictorial representation:

$$\frac{1}{4} of \frac{3}{4}$$

The figure represents $\frac{3}{4}$

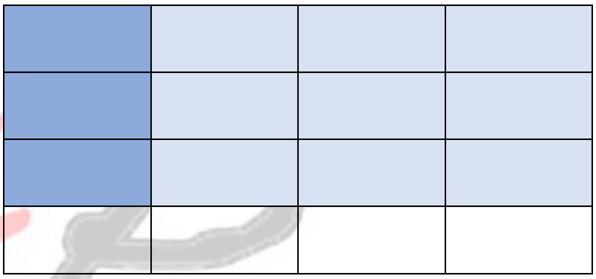


In order to find $\frac{1}{4}$ of $\frac{3}{4}$ we further divided $\frac{3}{4}$ into four equal parts.



Now we shade one out of the four parts.

This figure represents $\frac{1}{4}$ of $\frac{3}{4}$ which is $\frac{3}{16}$ (the double shaded region).



Multiplication of mixed fraction:

Multiplying mixed fraction just requires one extra step i.e. we must convert mixed fraction into improper fraction first, rest of the steps are same as multiplying two or more fractions.

Example 1	Steps followed	Example 2
$1\frac{7}{3} \times 3\frac{1}{9}$		$4\frac{2}{5} \times 3\frac{7}{11}$
$\frac{10}{3} \times \frac{28}{9}$	Convert the mixed fraction into Improper fraction and reduce (if possible)	$\frac{22}{5} \times \frac{40}{11}$
$\frac{10 \times 28}{3 \times 9}$	Multiply the numerators and denominators	$\frac{22 \times 40}{511}$
$\frac{280}{27}$	Reduce the fraction if possible	$\frac{\cancel{880}}{\cancel{55}}\ \frac{\cancel{176}}{\cancel{11}}\ \frac{16}{1}$
$10\frac{10}{27}$	Convert the product into mixed fraction (if possible)	16

Date: ____________ Day:__________

Multiplication of fraction as repeated addition:

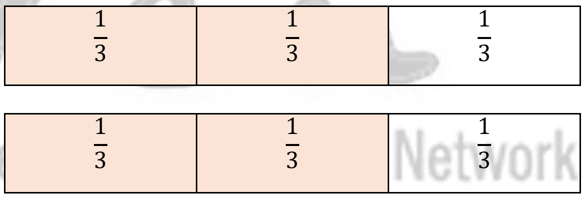
We already know that multiplication is real just repeated addition or adding the same number over and over again. The same is true for fraction. Let's see by comparing two example of multiplication of whole number by a whole number or by a fraction.

Multiply whole number by a whole number		Multiplying whole number by a fraction	
$= 4 \times 6$	4 groups of 6	$4 \times \frac{1}{8}$	4 groups of $\frac{1}{8}$
= 6+6+6+6	Adding the number four times to its self	$= \frac{1}{8} + \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$	Adding the fraction four times to its self
= 24		$= \frac{1+1+1+1}{8}$	When adding the denominator remains the same
		$= \frac{4}{8}$	
		$= \frac{1}{2}$	

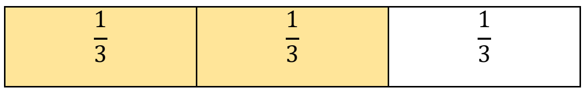
Using pictorial representation: Pictorial representation is just using diagram to show the same process as the symbolical method it sees it using an example

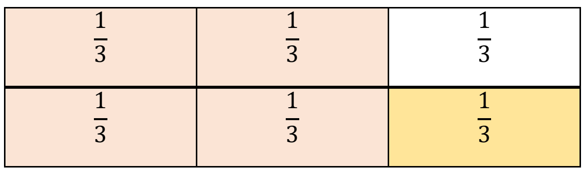
$$\frac{2}{3} \times 3$$

So, we can represent $\frac{2}{3}$ by dividing a shape into three parts of $\frac{1}{3}$ each and colouring two out of three.



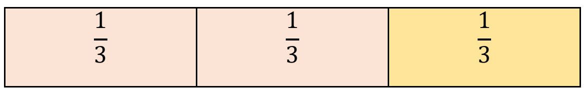
So $\frac{2}{3} \times 3$ can be shown as





If we look at the diagram closely, we can see that we have six $\frac{1}{3}$ colored in the diagrams which represent the parts we need so it we combine.

The colored parts are $\frac{6}{3}$ or 2 wholes



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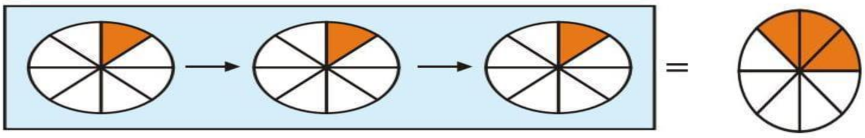
Activity 3(a)

Use the diagrams to solve the following:

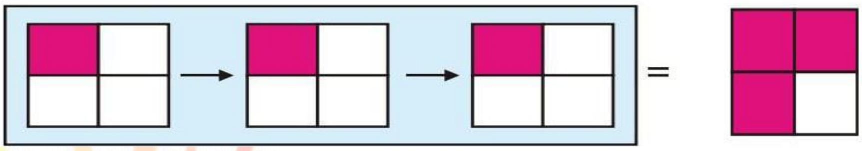
1. $\frac{1}{8} \times 3$



So,

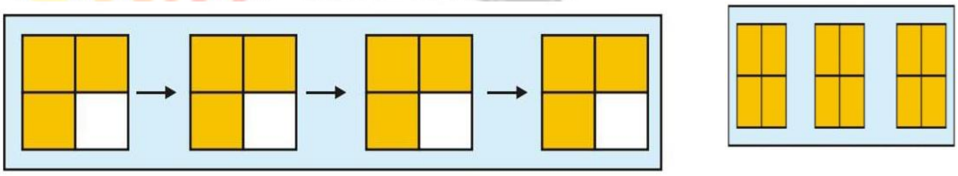
$\frac{1}{8} \times 3 =$ □ + □ + □ = □

2. $\frac{1}{4} \times 3$



□ + □ + □ = □

3. $\frac{3}{4} \times 3$



□ + □ + □ = □

EXERCISE 3C

1. **Simplify the following:**

a. $\frac{5}{6}$ ***of*** **9** **b.** $\frac{4}{8}$ ***of*** **6** **c.** $\frac{3}{14}$ ***of*** **45**

Date: ____________ Day:__________

2. Find the product of the following:

a. $\frac{1}{2} \times \frac{4}{10}$ b. $\frac{6}{9} \times \frac{8}{6}$ c. $\frac{15}{21} \times \frac{6}{9} \times \frac{1}{2}$ d. $\frac{8}{16} \times \frac{4}{8} \times \frac{3}{2}$

3. Solve and reduce to simplest form.

a. $4\frac{4}{5} \times 4\frac{3}{3}$ b. $8\frac{1}{4} \times 3\frac{2}{6}$ c. $2\frac{1}{6} \times 5\frac{1}{3} \times 3\frac{1}{7}$

Date: ____________ Day:__________

4. Multiply the fraction by the given whole number. Also demonstrate with the help of a diagram.

i. $\frac{3}{4} \times 4$ **ii.** $\frac{1}{3} \times 3$ **iii.** $\frac{3}{5} \times 5$

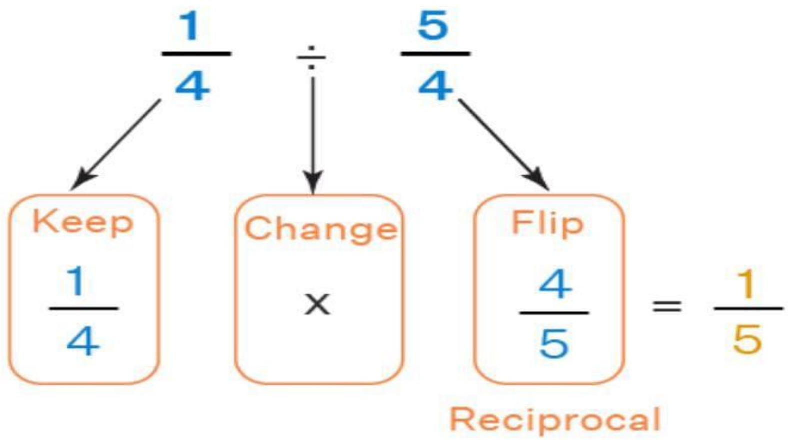
iv. $\frac{3}{2} \times 4$ **v.** $\frac{1}{4} \times 8$ **vi.** $\frac{1}{3} \times 6$

Date: ____________ Day:__________

Topic: Division of Fractions

Let's learn:

When we divide a fraction by another fraction, it is the same as multiplying the fraction by the reciprocal of the second fraction. The reciprocal of a fraction is a simple way of interchanging the fraction's numerator and denominator. Observe the following figure to learn a simple rule of dividing fractions.



Division of fraction with a whole number:

Division which is the opposite of multiplication will do the exact opposite that is we will multiply the whole number by the denominator and leave the numerator as it is.

Example 1 $\frac{1}{2} \div 4$

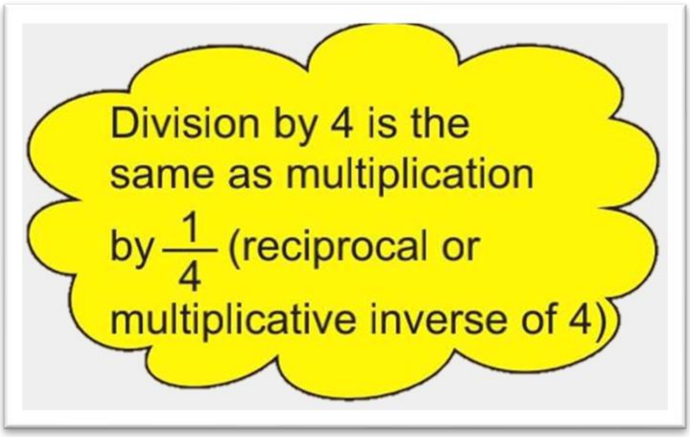
$= \frac{1}{2} \div 4$

Means that $\frac{1}{2}$ is divided into 4 equal parts. Thus, each part will be called $\frac{1}{4}$ of $\frac{1}{2}$

$= \frac{1}{4} \times \frac{1}{2}$ or $\frac{1}{2} \times \frac{1}{4}$

$= \frac{1 \times 1}{2 \times 4}$

$= \frac{1}{8}$



Date: ____________ Day:__________

Example 2: Solve $\frac{3}{7} \div 5$

$$= \frac{3}{7} \div \frac{5}{1}$$

$$= \frac{3}{7} \times \frac{1}{5}$$

Change division into multiply. At the same time reciprocate 5.

$$= \frac{3 \times 1}{7 \times 5}$$

$$= \frac{3}{35}$$

To change a whole number into a fraction we have to place the number over 1. The number become the numerator and 1 becomes the denominator of the fraction 5 is the same as $\frac{5}{1}$. We are just showing that the number includes 1 5 times.

Divide a whole number with a fraction:	Divide a fraction with a fraction:
Example 1: Solve $15 \div \frac{2}{3}$ $= 15 \times \frac{3}{2}$ — Always the number after the division sign is reciprocated. $= \frac{15 \times 3}{2}$ $= \frac{45}{2}$ — Reduce the fraction $= 22\frac{1}{2}$	When dividing a fraction by another fraction the method remains the same as multiplication only one step is added to reciprocate the second fraction. **Example1:** Solve $\frac{7}{9} \div \frac{14}{27}$ $= \frac{7}{9} \div \frac{14}{27}$ $= \frac{7}{9} \times \frac{27}{14}$ $= \frac{{}^{1}\cancel{7}}{{}^{1}\cancel{9}} \times \frac{\cancel{27}^{3}}{\cancel{14}^{2}}$ $= \frac{1 \times 3}{1 \times 2}$ $= \frac{3}{2}$ $= 1\frac{1}{2}$

Note: Always the number after the division sign is reciprocated

Date: ____________ Day:__________

Example 2 : Solve $2\frac{2}{7} \div 1\frac{3}{5}$

$$= 2\frac{2}{7} \div 1\frac{3}{5}$$

Convert the mixed fraction into Improper fraction and reduce (if possible)

$$= \frac{16}{7} \div \frac{8}{5}$$

Reciprocated the second fraction

$$= \frac{\overset{2}{\cancel{16}}}{7} \times \frac{5}{\cancel{8}_{1}}$$

Multiply the numerators and denominators. Reduce the fraction if possible

$$= \frac{2 \times 5}{7 \times 1}$$

$$= \frac{10}{7}$$

Convert the product into mixed fraction (if possible)

$$= 1\frac{3}{7}$$

EXERCISE 3D

1. Solve the following:

a) $6 \div \frac{2}{3}$ b) $\frac{2}{3} \div 8$ c) $\frac{12}{5} \div 9$

2. Solve the following:

a. $\frac{4}{9} \div \frac{16}{9}$ b. $\frac{4}{8} \div \frac{2}{12}$ c. $\frac{15}{20} \div \frac{3}{12}$

Date: ____________ Day:__________

d. $2\frac{1}{3} \div \frac{2}{4}$

e. $2\frac{4}{5} \div \frac{2}{3}$

f. $3\frac{6}{83} \div 4\frac{2}{4}$

g. $6 \div \frac{2}{3}$

h. $\frac{2}{3} \div 8$

i. $5\frac{1}{2} \div 1\frac{1}{4}$

Solve the following word problems.

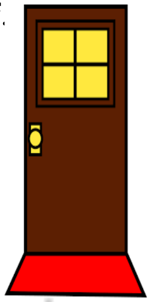
1) Talib buys $10\frac{1}{2}$ kg of tomatoes for Rs.210. What is the price of 1 kg of tomatoes?

Date: ____________ Day:__________

2) The camp cook made $1\frac{3}{4}$ kg of baked beans. Each serving of beans is $\frac{1}{4}$ kg. How many serving of beans did the cook make?

3) Rehan bought $82\frac{1}{2}$ metre cloth. He used this cloth for making uniform of 15 children of equal size. How much is cloth used in each dress?

4) The height of a door is $2\frac{2}{3}$meters. Out of which $\frac{1}{8}$ the part was trimmed off. How much was trimmed off?



5) An engineer drilled $\frac{5}{6}$ km of a tunnel in January and drilled only $\frac{1}{6}$ of pervious drill in February. What fraction of the tunnel they drilled in February?

Date: ____________ Day:__________

6) A piece of wire is $8\frac{1}{3}$meter long. Find the total length of wire. If their $13\frac{1}{5}$ such small pieces.

REVIEW EXERCISE 3

1. Tick (✓) the correct option.

1. $\frac{1}{3} + \frac{2}{5} =$ _________.

a. $\frac{3}{5}$ b. $\frac{3}{8}$ c. $\frac{2}{15}$ d. $\frac{11}{15}$

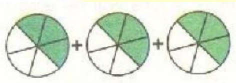
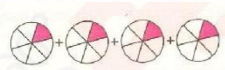
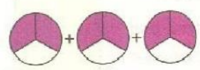
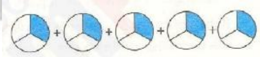
2. $\frac{2}{3} - \frac{5}{9} =$ _________.

a. $\frac{1}{9}$ b. $\frac{3}{9}$ c. $\frac{7}{3}$ d. $\frac{7}{9}$

3. The product of $\frac{3}{4}$ and $\frac{3}{4}$ is_________.

a. 1 000 b. 111 c. 100 d. 1

4. Which figure is showing $5 \times \frac{1}{3}$?

a. 
b. 
c. 
d. 

5. In ___________ the order of the fraction does not effect the result.

a. addition and subtraction b. subtraction and division c. multiplication and division d. addition and multiplication

6. The simplest form of $\frac{12}{4}$ *is* _____.

a. $\frac{1}{3}$ b. $\frac{1}{4}$ c. 3 d. 4

7. $\frac{3}{4}$ of a dozen is ________.

a. 912 b. 9 c. 6 d. 3

Date: ____________ Day:__________

2. Solve the following:

a) $\frac{7}{20} + 4\frac{3}{10}$

b) $3\frac{14}{50} - 2\frac{9}{25}$

c) $1\frac{16}{44} \div \frac{4}{11}$

d) $2\frac{6}{31} \times \frac{62}{24}$

e) $1\frac{4}{7} + 2\frac{13}{28} + \frac{3}{4}$

f) $\frac{5}{4} - \frac{1}{2} - \frac{1}{4}$

g) $\frac{11}{33} \div \frac{11}{33}$

h) $\frac{6}{5} \times 10$

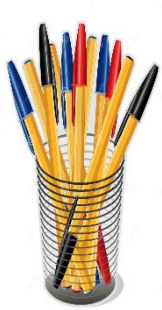
i) $\frac{4}{5} \times \frac{10}{3} \times \frac{9}{8}$

Date: ____________ Day:__________

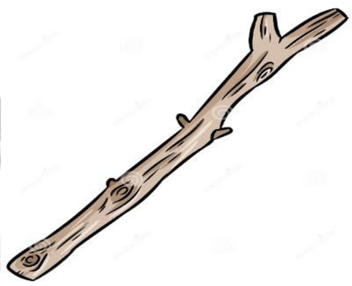
Solve the following word problems.

1) Farhan baked 12 lemon tarts for his son, Humza. He gobbled up 4 tarts. What fraction of tarts did Humza eat?

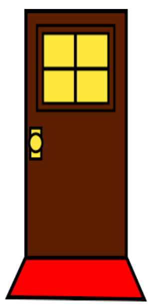
2) Five ball points are bought for Rs.$50\frac{3}{4}$. Find the price of one ballpoint.



3) How many halves metre piece can be cut from a stick which is $2\frac{1}{2}$ meters long?



4) The height of a door is $2\frac{2}{3}$ meters. Out of which $\frac{1}{8}$ the part was trimmed off. How much was trimmed off?



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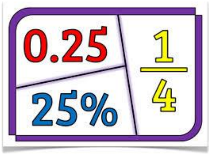


Unit #4: Decimals and Percentages

Learning Outcomes:

After Completing these activities, students will be able to:

- **Arrange numbers up to 3-digit numbers with 2-decimal place in ascending and descending order.**
- **Add and subtract 4-digit numbers up to 3- decimal places.**
- **Multiply a 3-digit number up to 2-decimal places by 10, 100, 1000.**
- **Multiply a 3-digit number up to 2-decimal places by a whole number up to 2-digit.**
- **Multiply a 3-digit number up to 2-decimal by a 3-digit number up to 2-dicimal places.**
- **Divide a 3-digit number up to 2-decimal places by 10, 100, 1000.**
- **Divide a 3-digit number up to 2-decimal places by a whole number up to 2-digit.**
- **Divide a 3-digit number up to 2-decimal by a 2-digit number up to 1-dicimal place.**
- **Convert fractions into decimal using division.**
- **Solve real life situations involving division of 3-digit numbers up to 2-decimal places.**
- **Round off a 4-digit number up to 3-decimal places to the nearest tenth or hundredth.**
- **Estimate sum or difference of the number (up to 4-digit).**
- **Recognize percentage as a special kind of fraction.**
- **Convert percentage into fraction and into decimal number and vice versa).**
- **Solve real life situation involving percentages.**

Topic: Recognizing and identifying decimal

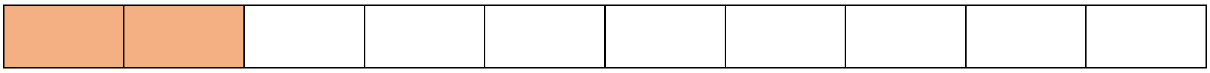
Let’s learn:

Known a decimal number as an alternate way of writing a fraction.

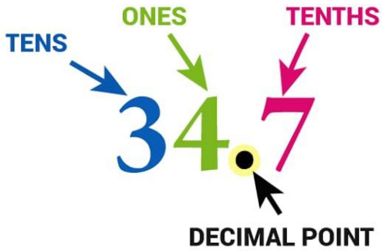
There is another way of writing common fraction called decimal. “A decimal number is a special type of a fraction whose denominator is 10 or a power of 10 which is 10, 100, 1000 etc.”

Date: ____________ Day:__________

Look at the fraction given below.



It represents a whole divided into 10 equal parts of which two are coloured. In common fraction form the shaded portion is written as $\frac{2}{10}$. and read as two tenth. In decimal form the shaded portion is written as 0.2 and read as two- tenth or 'zero point two.



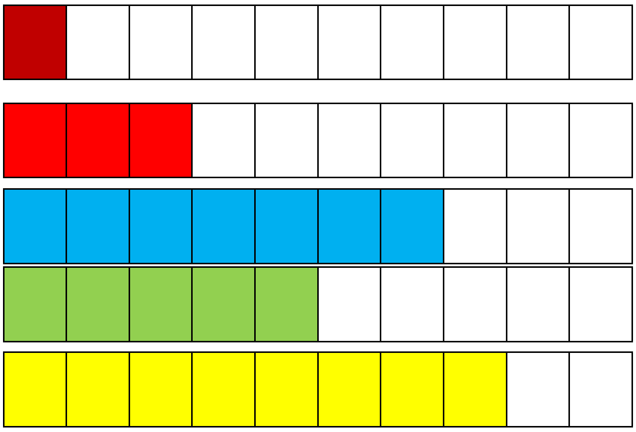
There will be one digit after the decimal point if the whole is divided into 10.

Whole number → 0.1 ← Fractional part

Here the dot (.) is known as a decimal point. It separates the whole number and the fractional parts.

Activity 4(a)

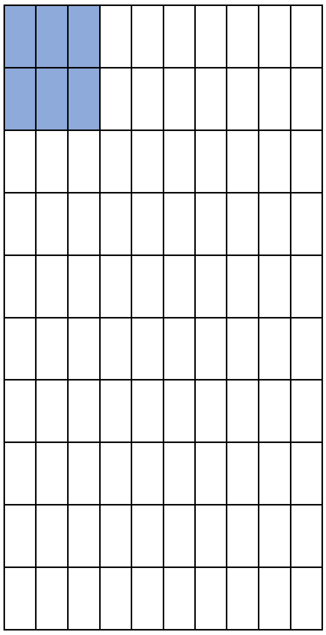
In the same way represent the coloured portion of each as a



Fraction	Decimal

Date: ____________ Day:__________

Now let's look at the fraction given. It represents a whole divided into 100 equal parts of which 6 are coloured. In fraction form it is written as $\frac{6}{100}$ as a decimal it's written as 0.06.



Recognize and identify the place value of a digit in decimal

The number of digits after the decimal point are called the decimal place. Look at the following example:

1. 3.2 represent decimal number up to **one decimal place** as it has only one digit after the decimal point.

Fraction part has a denominator of 10.

2. 1.43 represent decimal number up to **tow decimal place** as it has two digits after the decimal point.

Fraction part has a denominator of 100.

Date: ____________ Day:__________

3. 1.324 represent decimal number up to **three decimal places** as it has three digits after the decimal point.

Fraction part has a denominator of 1000.

In decimal fraction the value of a digit decreases by 10 times. Look at the following tables to understand the place value in decimal numbers.

Fractions	H	T	O	.	t tenth	h hundredth	th thousandth
$\frac{1}{10}$			0	.	1		
$\frac{1}{100}$			0	.	0	1	
$\frac{1}{1000}$			0	.	0	0	1

- The first digit after the decimal point has a place value of 'one-tenths' or '0.1' and it is the first decimal place.
- The second digit after the decimal point has a place value of 'one-hundredth' or '0.01' and it is the second decimal place.
- The third digit after the decimal point has a place value of 'one-thousandths' or '0.001' and it is the third decimal place.

Example 1: Write the place values of encircled digits in the following numbers:

(1) 53.(5)79 — 5 tenths or $\frac{5}{10}$ or 0.5

(2) 1.0(3)2 — 3 hundredths or $\frac{3}{100}$ or 0.03

(3) 2.1(1)37 — 1 hundredths or $\frac{1}{100}$ or 0.01

(4) 123.87(3) — 3 thousandths or $\frac{3}{1000}$ or 0.003

Date: ____________ Day:__________

Example 2: Identify the place value of each digit in **23.416**

Let's first write the given number under the place value chart.

T	O	.	t	h	th
2	3	.	4	1	6

2 tens or 20

3 ones or 3

4 tenths or 0.4

1 hundredths or 0.01

6 thousandths or 0.006

Place value of 2 = 2 tens = 2 x 10 = 20

Place value of 3 = 3 ones = 3 x 1 = 3

Place value of 4 = 4 tenths = $\frac{4}{10}$ = 0.4

Place value of 1 = 1 hundredths = $\frac{1}{100}$ = 0.01

Place value of 6 = 6 thousandths = $\frac{6}{1000}$ = 0.006

EXERCISE 4 A

1. Draw the figure of the following.

i. 0.3

ii. 0.8

iii. 0.103

iv. 0.17

v. 0.34

2. Write down the number of decimal places in each.

i. 123.1 ii. 57.322 iii. 0.87

3. Write down the place value of encircled digit.

(i) 725.0(4) (ii) 135.(8)5 (iii) 5.09(2)

Date: ____________ Day:__________

Topic: Comparing and ordering decimal

Let's learn:

Decimal numbers can be compared and ordered. Comparing decimals means determining which decimal represents a larger number, and which represents a smaller number. Ordering decimals means putting them in order from the least to the greatest, or from the greatest to the least. It is helpful to know how to compare and order decimals in science, math, and real-life situations. Here are a few real-life examples.

Comparing Example

5.473 ☐ 5.474

(Step 1)	(Step 2)	(Step 3)	(Step 4)	(Step 5)
Copy the numbers vertically, with **decimal points aligned**	Compare the **whole numbers.** Because they match, move to the next digit	Compare the digits in the **tenths** place. Because they match, move to the next digit	Compare the digits in the **hundredths** place. Because they match, move to the next digit	Compare the digits in the **thousandths** place. They do not match! So, we compare those digits
5.473 5.474	5.473 5.474	5.473 5.474	5.473 5.474	5.473 5.474 3 < 4

5.473 [<] 5.474

Activity 4(b)

○ **Circle the largest out of each card.**

- 0.9 0.5
- 2.4 2.44
- 3.727 3.272
- 0.01 0.011
- 9.1 9.01
- 10.35 10.354
- 21.75 21.75
- 43.5 4.35
- 5.4 5.17
- 0.6 0.06

Date: ____________ Day:__________

○ **Arrange the following decimal fractions**	**Ascending Order**	**Descending Order.**
1) 9.7, 9.07, 9.007, 9.1, 9.03 2) 0.01, 0.02, 0.23, 0.2, 0.21 3) 4.3, 5.7, 3.8, 2.1, 6.4 4) 0.5, 0.75, 0.39, 1.4, 1.04 5) 1.037, 1.3, 1.317, 1.33, 1.03		

Topic: Addition and Subtraction of Decimals

Let’s learn:

Addition and subtraction of decimals are a bit complex as compared to performing the operations on natural numbers. The addition of decimals involves several steps.

> If a number consists of only a whole number part and we want to describe it in decimal, we take zero as decimal, for example 36 36.0 up to one decimal place or 36.00 up to = two decimal places.

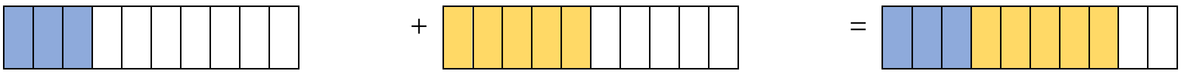
How to Add Decimals?

Addition of decimals is performed using the following steps:

- Line up the decimal points vertically. Fill in any 0’s where necessary.
- Add or subtract the numbers as if they were whole numbers.
- Place the decimal point in the sum or difference so that it lines up vertically with the numbers being added and subtracted.

Let’s look at the following example to understand the addition of decimals.

Example 1: Add 0.3 and 0.5



0.3 + 0.5 = 0.8

Date: ____________ Day:__________

We can also write them as:

$$\begin{array}{cccc} & 0 & . & 3 \\ + & 0 & . & 5 \\ \hline & 0 & . & 8 \\ \hline \end{array}$$

Key fact: If the number of digits after the decimal point are not equal, we put required number of zeros as place holder in the decimals to be added or subtracted.

Example 2: Solve 20.25 + 7.52

$$\begin{array}{cccccc} & 2 & 0 & . & 2 & 5 \\ + & 0 & 7 & . & 5 & 2 \\ \hline & 2 & 7 & . & 7 & 7 \\ \hline \end{array}$$

Example3: Evaluate 0.56 + 9 + 6.287

$$\begin{array}{cccccc} & & 0 & . & 5 & 6 & 0 \\ & & 9 & . & 0 & 0 & 0 \\ + & & 6 & . & 2 & 8 & 7 \\ \hline & 1 & 5 & . & 7 & 4 & 7 \\ \hline \end{array}$$

How to subtract Decimals? Once you know how to add decimals, subtracting them is quite similar. You must be wondering how is adding and subtracting decimals similar? Let's look at the steps.

Steps to Subtract Decimals

Step 1: Convert unlike decimals into like decimals.

Step 2: Write the digits in their respective columns according to the place.

Step 3: Put the decimal point one below the other so that all the decimal points are in the same vertical line.

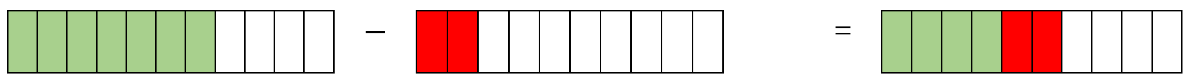
Step 4: Start subtracting from the rightmost digit and move toward the leftmost digit.

Step 5: Place the decimal point under the decimal point in the answer.

Let's look at the following example to understand the subtraction of decimals.

Example 1: Subtract 0.6 and 0.2.

Method 1:



0.6 − 0.2 = 0.4

6 tenths − 2 tenths = 4 tenths

Method 2:

$$\begin{array}{cccc} & 0 & . & 6 \\ - & 0 & . & 2 \\ \hline & 0 & . & 4 \\ \hline \end{array}$$

Date: ____________ Day:__________

Example 2: Subtract the following.

i. 3.57 – 2.34

	3	.	5	7
–	2	.	3	4
	1	.	2	3

ii. 7.84 – 1.75

	7	.	7 8	(14) 4
–	1	.	7	5
	6	.	0	9

EXERCISE 4B

1. Add the following:

a) 22.32 + 6.46 b) 45.005 + 52.47 c) 45.468 + 277.358

d) 4.567 + 36.4 e) 75.05 + 24.62 f) 287.099 + 8.258

2. Subtract the following.

a) 25.52 – 6.3 b) 49.123 – 7.02 c) 75.75 – 24.62

d) 74.567 – 33.402 e) 257.003 – 0.25 f) 935.69 – 805.365

Date: ____________ Day:__________

3. Use pictorial representation to solve these.

a) 0.3 + 0.9 +0.4 b)0.9 – 0.3 c)0.3 + 0.4

d) 0.8-0.6 e) 1.5 + 3.9 f) 0.7 – 0.

Topic: Multiplication of Decimal by 10, 100, 1000

Let's learn:

There are three different cases in dividing decimals, such as:

1) Multiplication of Decimal by 10, 100, 1000
2) Multiplying Decimals by Whole number
3) Multiplying Decimal by Decimal Number

Multiplication of Decimal by 10, 100, 1000

Let's look at an example by using the simple multiplication method

Example 1: Multiply 4.56 and 10

		4.	5	6
×			1	0
		0	0	0
	4	5	6	0
	4	5.	6	0

Date: ____________ Day:__________

- Step 1 --- Ignore the decimal
- Step 2 --- Rewrite the problem
- Step 3 --- Multiply the problem
- Step 4 --- Underline all numbers to the right of decimal(s) in original problem
- Step 5 --- Move decimal that many places left in your answer

So, 4.56 × 10 = 45.60

We can also perform the same operation using some trick. These tricks are also called mental Math method.

When multiplying by 10 or 100, or any power of ten, for that matter, move the decimal point the same number of places as there are zeros in the power of ten factor. For example, how many zeros are in 10? One. How many zeros in 100? Two. That's how many places you move the decimal point. Now, let's look at a few multiplication examples.

$673.234 \times 10 = 673.234 = 6732.34$

$673.234 \times 100 = 673.234 = 67323.4$

$673.234 \times 1000 = 673.234 = 673234.0$

Keep in mind that whole numbers have an implied decimal point, as shown here: 7 = 7.00000000

Multiplication of Decimal by whole number

To multiple a decimal number by the whole number to process is similar as the multiple can of any number. In the answer you put the same number of digits after the decimal point as there were in the original decimal number.

Let's look at some examples to understand this concept better.

Example 1: Multiply 74.15 × 3

		7	4	1	5
×					3
	2	2	2	4	5

Do the multiplication just as in the case of whole number, ignoring the decimal point for a while.

Multiply the unit or ones. Multiply the tens.

		7	4	.	1	5
×						3
	2	2	2	.	4	5

Now look at the total number of decimal places in the numbers being multiplied. There is only one decimal place so, the product should also have one decimal place. Put decimal place from the right.

Two decimal places in the product.

Date: ____________ Day:__________

Example 2: Multiply 2.3 × 24

			2	.	3
×				2	4
				9	2
			4	6	0
		5	5	.	2

Step 1: Neglect the decimal point. Multiply 3 by 4, We get 12, write 2 at first place and carry 1. Multiply 2 by 4, we get 8, add 1 in 8, we get 9, write in second place, we get 92.

Step 2: Write 0 in ones place. Multiply 3 by 2, we get 6, write 6 after zero. Now multiply 2 by 2, we get 4.

Step 3: Add all the digits of ones and tens, we get 552.

Step 4: Count decimal places in given numbers to be multiplied.

Step 5: Put a decimal point after one digit, count from right digit. We get 55.2

Multiplying Decimal by Decimal Number:

To multiply a decimal number by a decimal number, we first multiply the two numbers ignoring the decimal points and then place the decimal point in the product in such a way that decimal places in the product is equal to the sum of the decimal places in the given numbers.

> We already known about
> One- tenth = 0.1 and one- hundredth = 0.01

Let's see what happens when we multiply these with a decimal number.

Example 1: Find the product

1. 2.23 × 0.1

		2	.	2	3
x			0	.	1
		0.	2	2	3

In 2.23 we have 2 decimal places and in 0.1 we have one decimal place. When we write their product then we add decimals digit and we get 3 decimal places. Count from right up to 3 decimal place and place the decimal there.

2. 2.23 × 0.01

			2	.	2	3
x			0	.	0	1
	0	.	0	2	2	3

In 2.23 we have 2 decimal places and in 0.01 we have 2 decimal place. When we write their product then we add decimals digit and we get 4 decimal places. Count from right up to 4 decimal place and if digit are less than 4 places write zeros as we need, as show in the example, we write 2 zero.

Example 2: Multiply 73.24 and 5.1.

			7	3	.	2	4	2 decimal place
x					5	.	1	1 decimal place
				7	3	2	4	
		3	6	6	2	0	0	
	3	7	3	.	5	2	4	We place the point so that there are 3 decimal places.

EXERCISE 4 C

1. Use the rule of Multiplication to find the product of each.

i.0.157 × 10 ii. 8.15 × 100 iii. 0.103 × 1000

iv.0.17 ×1000 v. 0.34 × 10 vi. 0.157 × 100

Date: ____________ Day:__________

2. Find the product of each.

i. 0.3 × 8.2

ii. 6.5 × 5

iii. 0.265 × 36

iv. 0.28 × 27

v. 4.25 × 9

vi. 47.326 × 348

○ Solve the Following:

i. 2.6× 0.1

ii. 3.87 × 0.2

iii. 42.8 × 0.3

Date: ____________ Day:__________

iv. 59.95×0.05 v. 42.5×0.05 vi. 0.01×0.01

Topic: Division of Decimal numbers

Let's learn: Just like multiplication division of decimal numbers is down in the same manner as the division of a whole number. There are three different cases of dividing decimals such as:

1. Division of decimal by 10, 100, 1000 etc.
2. Division of decimal by a whole number.
3. Division of decimals by decimal number.

Division of decimal number by 10, 100, 1000

For the division of decimals, the most basic concept is dividing by 10 and multiples. The decimal shifts to the left by as many places as the zeroes in the divisor. If the number of places is less than place then the required number of zeroes to the left of the digits, place the decimal there. Let's look at these examples:

Rules:

1. Divide a decimals by 10, then the value of the decimals decreases ten times.

   $15.34 \div 10 = 1.534$

   (What happened to value of 15.35?)

2. Divide a decimals by 100 then the value of the decimals decreases hundred times.

   $15.34 \div 100 = 0.1534$

3. Divide a decimals by 1000, then the value of the decimals decreases one thousand times.

   $015.34 \div 1000 = 0.01534$

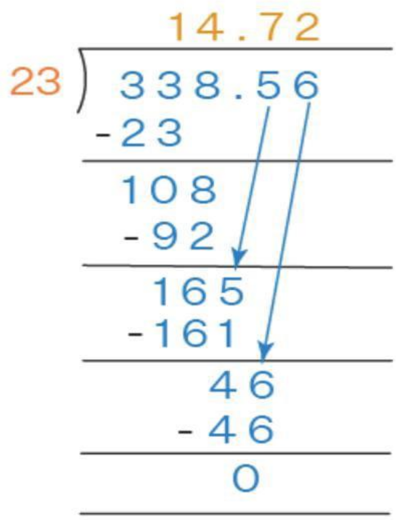
Date: ____________ Day:__________

Division of decimal by a whole number

Dividing Decimals is similar to dividing whole numbers, keeping in mind the position of the decimal point. While dividing decimal numbers, we need to follow a certain set of rules but the basic process of division remains the same. Let's as learn how to divide decimals with whole numbers.

Long Division of Decimals:

The long division of decimals can be easily done like the normal long division. Let us understand this using an example.



Example: Divide 338.56 ÷ 23

Step 1: First, write the division in the standard form. Start by dividing the whole number part by the divisor.

Step 2: Place the decimal point in the quotient above the decimal point of the dividend. Bring down the tenth digit.

Step 3: Divide and bring down the other digit in sequence. Divide until 0 is obtained in the remainder. Thus, the decimal in the quotient is placed according to the decimal in the dividend.

Division of decimals by decimal number

There are two methods of dividing decimal numbers by decimal numbers. These are by converting a decimal number to a fraction and solving or without converting method.

As we know decimal numbers are just simplified versions of fraction so they can be converted into one and other.

To convert a decimal into a fraction, we need to first write the given decimal in the form of a fraction, by adding a denominator 1. Then we need to multiply both numerator and denominator with the multiples of 10, to remove decimal (.) from the given number. For example, 1.9 is a decimal number, then the equivalent fraction will be 19/10. We cannot simply 19/10 further.

Example 1: Write 0.7 as a fraction?

$\frac{0.7}{1}$ Write decimal number as fraction with one as denominator.

$\frac{0.7 \times 10}{1 \times 10}$ Now multiply the numerator and denominator by multiples of 10, for every decimal point, such that the decimal in the numerator becomes a whole number.

Date: ____________ Day:__________

$\frac{7}{10}$ Simplify if possible.

Now let's use thing to solve the division of decimal number by decimal number.

Example 1: Solve 2.48 ÷ 1.24

We can say that 2.48 = $\frac{248}{100}$ and 1.24= $\frac{1.24}{100}$ so,

2.48 ÷ 1.24 = $\frac{248}{100} \div \frac{124}{100}$ Now use division method of fraction

$= \frac{248}{100} \times \frac{100}{124}$ Reciprocated the second fraction

$= \frac{248}{124}\ \frac{124}{62}\ \frac{62}{31}\ \frac{2}{1}$

= 2

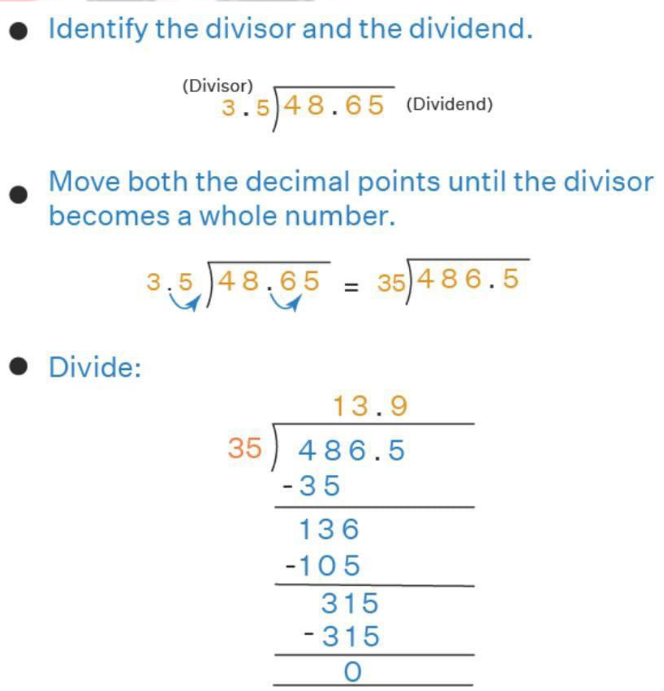
For dividing decimals by another decimal, we need to convert the divisor into a whole number and then continue the division. Let us understand the conditions and rules for this method using an example.

Example: Divide 48.65 ÷ 3.5

Solution: In this division, the dividend and the divisor are decimals, so we need to convert the divisor to a whole number using the following steps.

Step 1: The dividend is 48.65 and the divisor is 3.5. We need to change the divisor to a whole number and so we will multiply it by 10 so that the decimal point shifts to the right and it becomes a whole number. This means, 3.5 × 10 = 35.

Step 2: We need to treat the dividend in the same way as we had treated the divisor. So, we will multiply the dividend by 10 as well. This means it will be 48.65 × 10 = 486.5. In other words, we need to move both the decimal points to the right until the divisor becomes a whole number.



Date: ____________ Day:__________

Step 3: Now, we have 486.5 as the dividend and 35 as the divisor. This can be divided as we do the usual division and we get 13.9 as the quotient.

EXERCISE 4 D

1. **Use the division rules to find the quotient.**

1) 6.675 ÷ 10 **2) 35.89 ÷ 1000** **3) 815.4 ÷ 100**

4) 0.058 ÷ 100 **5) 0.0175 ÷ 1000** **6) 24.25 ÷ 10**

2. **Solve.**

a. 0.65 ÷ 5 **b. 3.6 ÷ 6** **c. 87.03 ÷ 9**

Date: ____________ Day:__________

3. **Solve up to 3-decimal place.**

(1) 40.25 ÷ 4 (2) 0.265 ÷ 20 (3) 98.58 ÷ 3

(4) 3.16 ÷ 2.31 (5) 89.64 ÷ 6 (6) 14.04 ÷ 12.4

4. **Solve by converting decimal to fractions.**

1. 2.16 ÷ 0.6
2. 0.6017 ÷ 1.1
3. 3.5308 ÷ 0.13
4. 5.76 ÷ 0.24
5. 78.4 ÷ 0.7
6. 7.7 ÷ 3.5

Date: ____________ Day:__________

5. **Solve the following decimal using direct division method by moving decimal positions.**

1. 0.016 ÷ 0.2 **2. 0.18 ÷ 0.3** **3. 0.36 ÷ 0.6**

4. 4.096 ÷ 0.16 **5. 1.018 ÷ 0.9** **6. 0.96 ÷ 0.4**

Topic: Conversion of Fraction into Decimals

Let's learn:

As we have learned before fraction is any other way of writing division i.e. 3 ÷ 4 is the same as $\frac{3}{4}$ and since decimal numbers are just the simplest form of fraction, we can say that we can convert fractions into decimals just by dividing the numerator by the denominator.

How do I turn fractions into decimals?

Fractions can be converted into decimals by using long division. For example, the fraction $\frac{4}{25}$ is expressing "4 divided by 25." This can be set up as $25\overline{)4}$. Place a decimal and zeros after the 4 so that it becomes 4.00. Now we have $25\overline{)4.00}$. We know that 25 does not go into 4, but it does go into 40 one time. From here, the standard rules of long division apply. The result will be 0.16. The important thing to remember is that the fraction bar represents division, so fractions can be calculated as decimals by dividing the numerator by the denominator.

Date: ____________ Day:__________

Consider the following examples

Example1: Convert the following

a) $\frac{2}{5}$ b) $\frac{10}{6}$

$$\begin{array}{r} 0.4 \\ 5\overline{)20} \\ -\ 20 \\ 0 \end{array}$$

So, $\frac{2}{5} = 0.4$

$$\begin{array}{r} 1.66 \\ 6\overline{)10} \\ -\ 6 \\ \hline 40 \\ -\ 36 \\ \hline 40 \\ -36 \\ \hline \end{array}$$

Remainder →4

So, $\frac{10}{6} = 1.66$

Activity 4 (c) Change he following fraction into decimals

1. $\frac{5}{4}$ 2. $\frac{7}{10}$ 3. $\frac{32}{7}$

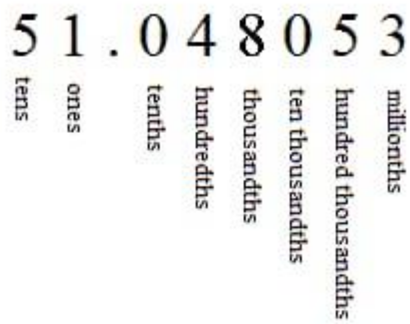
4. $\frac{17}{20}$ 5. $\frac{250}{8}$ 6. $\frac{300}{250}$

Date: ____________ Day:__________

Topic: Rounding off Decimals and Estimation

Let's learn:

Rounding is a process of estimating a particular number in a context. We can round decimals to a certain accuracy or number of decimal places. This is used to make calculation easier to do and results easier to understand, when exact values are not too important. First, you'll need to remember your place values.



Consider the following decimals to the nearest whole number.

Example1: Round off the following to the nearest whole number:

i) 4.2 ii) 4.5 iii) 4.7

This is a number line, 3.8, 3.9, 4.0, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 5.0, 5.1 and 5.2 are represented on it.

Solution:

i) 4.2

So, 4.2 = 4

Look at the number line. 4.2 is close to 4 than to 5; and 4.2 is nearest to 4.

ii) 4.5

So, 4.5 becomes 5 after round off.

Look at the number line. 4.5 is equally closer to 4 and 5. If it is = or > 5, round of the numbers accordingly.

iii) 4.7

So, 4.7 = 5.

Look at the number line. 4.7 is close to 5 than to 4; and 4.7 is nearest to 5.

Date: ____________ Day:__________

Round 72.673 to its nearest tenths.

72.473 ⟶ 72.5

1. 4 at the tenths place is to be rounded.
2. The next digit to the right is 7.
3. 7 > 5, so 1 is added to 4. 7 and 3 are removed.

Round 35.4352 to its nearest hundredths.

35.4321 ⟶ 35.43

1. 3 at the hundredths place is to be rounded.
2. The next digit to the right is 2.
3. 2 < 5, so 0 is to added to 3. 2 and 1 are removed.

Rules for rounding off a decimal

1. Locate the digit to be rounded.
2. Look at the digit to the right.
3. If the digit is less than 5 it will remain unchanged.
4. If it is greater than or equal to 5 add 1 to the preceding number.

Estimation means to find an answer that is close to but not exact. It is a reasonable answer to a problem.

In mathematics, we often look for exact answers. But in real life, a little difference in the answer does not make any difference. This guessing is known as estimation. Estimation is nothing but finding a number that is close enough to the exact answer. The sign for estimation is "≈".

To estimate we first round off the number to a whole number and then perform the operation accordingly.

Why should we use estimation?
We should use estimation because,

- It is a skill for life
- It helps us to focus on
- It sometimes saves time
- It helps to gain confidence, helps in judgment and in decision making

Estimating sum and Difference of Decimals

Consider the examples:

Example1: add 15.5 and 6.5

As, from rounding off we know that

$$\begin{array}{rr} & 1\ 6 \\ + & 7 \\ \hline & 2\ 3 \end{array}$$

$15.5 \approx 16$
$6.5 \approx 7$

So, $15.5 + 6.5 \approx 16 + 7 = 23$

Now, actually add the value and let's check our answer

$$\begin{array}{rr} & 1\ 5\ .\ 5 \\ + & 6\ .\ 5 \\ \hline & 2\ 2\ .\ 0 \end{array}$$

Example2: Subtract 86.9 and 17.8

As, from rounding off we know that

$$\begin{array}{rr} & 8\ 7 \\ - & 1\ 8 \\ \hline & 6\ 9 \end{array}$$

$86.9 \approx 87$
$17.8 \approx 18$

So, $86.9 - 17.8 \approx 87 - 18 = 69$

Now, actually add the value and let's check our answer

$$\begin{array}{rr} & 8\ 6\ .\ 9 \\ - & 1\ 7\ .\ 8 \\ \hline & 6\ 9\ .\ 1 \end{array}$$

Date: ____________ Day:__________

EXERCISE 4 E

1. Round off to nearest whole number.

1. 2.3 2. 99.9 3. 50.2

4. 5.6 5. 9.9 6. 81.7

2. Round off to one decimal place.

1. 32.38 2. 6.17 3. 50.4752

4. 3.432 5. 11.7681 6. 5.95

3. Round off to two decimal places.

1. 119.0185 2. 09627 3. 32.386

4. 6.775 5. 10.9807 6. 25.056

4. Estimate the given sum and verify the answer.

1. 46.5 + 21.1 2. 50.8 + 38.0 3. 8.6 + 5.9

4. 94.57 + 33.2 5. 3.7 +8.5 6. 7.7 + 3.5

5. Estimate the given difference and verify the answer.

1. 2.16 – 0.6 2. 88.5 – 5.8 3. 909.4 – 89.7

Date: ____________ Day:__________

Topic: Percentages

Let's learn:

The word percent is made up of two words, "per" and "cent". Per means out of and Cent means hundred. Therefore, percentage means a part of hundred. Percentages are fraction with 100 as the denominator. It is represented by the symbol "%".

1% makes $\frac{1}{100}$ means 1 out of 100 = 0.01.

10% makes $\frac{10}{100}$ means 10 out of 100 = 0.1.

100% makes $\frac{100}{100}$ means 100 out of 100 = 1.

You can consider each 'whole' as broken pieces of 100 equal parts. Each one of with is a single percentage. Since a percent is a fraction, and a fraction can be written as a decimal. This means any of these forms can be converted to any of the others. Look at the chart below for detailed information on how to make conversions between fractions, decimals, and percent.

Conversion of percentage to fraction and to decimal.

Consider these examples

Example 1: Convert the following percentage into fraction and then into decimal.

(i) 15% ii) 75%

Solution:

(i) $15\% = \frac{15}{100} = \frac{\cancel{15}^{3}}{\cancel{100}_{20}} = \frac{3}{20}$, it is fractional form.

and $15\% = \frac{15}{100} = 0.15$, it is decimal form.

(ii) $75\% = \frac{75}{100} = \frac{3 \times \cancel{25}^{1}}{4 \times \cancel{25}_{1}} = \frac{3}{4}$, it is fractional form.

and $75\% = \frac{75}{100} = 0.75$, it is decimal form.

Date: ____________ Day:__________

Conversion of decimals into percentage.

Example 2: covert the following decimal into fraction and then into percentage.

1) 0.50 2) 2.45

Solution:

1) $0.50 = \frac{50}{100} = \frac{1}{2}$

Now, $0.50 = \frac{50}{100} = 50\%$

2) $2.45 = \frac{245}{100} = \frac{49}{20} = 2\frac{9}{20}$.

Now, $2.45 = \frac{245}{100} = 245\%$

Example3: Express the fraction $\frac{3}{5}$ as percentage.

Solution:

$= \frac{3}{5}$

$= \frac{3 \times 20}{5 \times 20}$

$= \frac{60}{100}$

$= 60\ \%$

To convert any fraction into percentage. We convert the denominator into 100 and the numerator becomes the percentage.

EXERCISE 4 F

1. Convert the given percentages into fraction and then into decimal.

1. 25% 2. 30% 3. 115%

Date: ____________ Day:__________

4. 56% 5. 85% 6. 81%

2. Convert the given decimal into fraction and then convert into percentage.

1. 0.8 2. 0.34 3. 0.63

4. 550 5. 25.5 6. 3.60

3. Express the following fractions as percentages.

1. $\frac{4}{5}$ 2. $\frac{6}{25}$ 3. $\frac{11}{20}$

Date: ____________ Day:__________

4. $\frac{5}{12}$ 5. $\frac{19}{60}$ 6. $\frac{71}{50}$

REVIEW EXERCISE 4

1. Tick (✓) the correct option.

1. While putting _______ at the right of a decimal does not effect its value.

a) 0 b) 1 c) 10 d) 100

2. When multiply a decimal by 100, we move decimal point 2 places to the ____________.

a) left b) down c) up d) right

3. We represent percentage by the symbol___________.

a) ≤ b) ∅ c) **Ψ** d) %

4. 20% of 540 is_________.

a) 27 b) 37 c) 108 d) 270

5. Percentage is a special kind of fraction whose denominator is always ______.

a) 1 b) 10 c) 100 d) 1 000

2. Compare the following decimal using the correct symbol (>, < or =).

a) 0.5______0.8 b) 1.8______ 1.4 c) 45.67_______ 45.77

d) 7.78______ 7.70 e) 1.56_____ 1.56 f) 34.23______ 62.42

Date: ____________ Day:__________

3. Solve the following.

a) 5.242 + 9.003 b) 3.622 + 22.971 c) 4.32 + 90.16

d) 13.12 + 86.57 e) 58.57 + 6.118 f) 4.561 + 27.16

g) 92.93 + 31.33 h) 8.25 – 4.97 i) 4.63 – 1.21

j) 22.92 – 2.001 k) 6.119 – 1.55 l) 20.36 – 6.211

4. Solve the following.

a) 52.855 × 10 b) 4.39 × 100 c) 5.98 × 1 000

Date: ____________ Day:__________

d) 6.54 × 21 e) 4.14 × 43 f) 7.17 × 6.5

g) 69.7 × 2.31 h) 2.19 × 4.87 i) 4.13 × 6.12

j) 82.6 ÷ 100 k) 3.12 ÷ 1.3 l) 4.21 ÷ 2.5

5. Estimate the sum and difference of the given numbers. Then verify your result.

a) 74.1 + 3.9 b) 74.92 – 36.02 c) 521.2 + 479.8

Date: ____________ Day:__________

d) 3.5 – 2.1

e) 63.1 + 6.9.1

f) 324.6 – 241.6

6. Round- off the following decimals to the nearest tenths and hundredths.

Decimals	Rounded off up to 1 decimal place (nearest tenths)	Rounded off up to 2 decimal places (nearest hundredths)
a) 2.2342		
b) 3.1723		
c) 5.3671		
d) 9.5191		

7. Complete the table.

Fraction	Decimals	Percent
$\frac{21}{50}$		
		82%
$\frac{7}{25}$		
	0.65	
		25%

Date: ____________ Day:__________

Solve the word problem.

1. Araiz scored 456 out of 600 in a final examination. What is the percentage of his score?

2. In a school the number of students is 1 200. In class V have 20% of the students. How many students in class V?

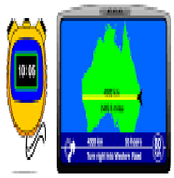
3. The cost of a pen is Rs.25.25, pencil is Rs. 10.9 and that of a book is Rs. 120.67. If Ali has Rs. 150 how much more money does he need to buy all three items at the shop?

4. There are 4.5 liters of milk in a pot. The chef stirs in 2.5 g of salt and 1.2 litres of water. How much liquid is in the pot?

5. The product of numbers is 42.63. If one number is 2.1, find the other.

6.One kg Basmati rice cost Rs. 430.57. Find the cost of 17 kg of rice.

Date: ____________ Day:__________



Unit #5: Distance and Time

Learning Outcomes:

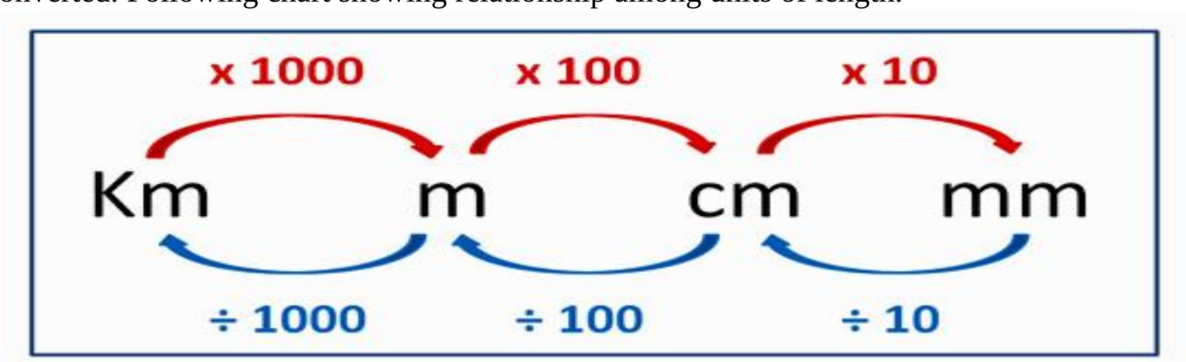
After Completing these activities, students will be able to:

- **Convert measures given in**
  - **Kilometer into meters and vice versa**
  - **Meters into centimeters and vice versa**
  - **Centimeters into millimeters and vice versa.**
- **Solve real life situations involving conversion, addition and subtraction of measures of distance.**
- **Convert**
  - **Hours into minutes and vice versa**
  - **Minutes into second and vice versa.**
- **Convert**
  - **Years into months and vice versa.**
  - **Months into days and vice versa**
  - **Weeks into days and vice versa.**
- **Add and subtract intervals of time in hours and minutes with carrying and borrowing.**
- **Solve real life situations involving conversion, addition and subtraction of intervals of time.**

Topic: Conversion of Units of Distance

Let's learn:

Distance is the length of space between two things, points, and lines, etc. Distance is the measurement of length. We know the units of measuring length. Unit of length can be converted. Following chart showing relationship among units of length.



Date: ____________ Day:__________

It should be noted that when the bigger units of lengths are converted into smaller units, we multiply the bigger units with their equivalent smaller units.

Similarly, when the smaller units are converted into bigger units, we divide the smaller unit by the equivalent bigger units.

Now consider some examples to learn the process of this convergence.

Conversion of kilometers to metres.

Example 1: Convert 5 km to meters.

Solution:

Distance = 5 km

= (5×1000) m

= 5000 m

Example 2: Convert 8 km 150 m into meters.

Solution:

Distance = 8 km 105 m

= (8×1000)m + 105 m

= 8000 m + 105m

= 8105m

Conversion of metres to kilometers.

Example 3: Convert 12000 m to km.

12000 m = 12000 ÷ 1000 km

$= \frac{12\cancel{000}}{1\cancel{000}}$ km = 12 km

Example 4: Convert 18450 m to km and m.

18450 m = 18 000 m + 450 m

$= \frac{18\ \cancel{000}}{1\cancel{000}}$ km + 450 m

= 18 km + 450m

= 18 km 450 m

We separate the thousand values from other to make division easy.

```
          18 km
1000 ) 18 450
  –    18 000
          450 m
```

Date: ______________ Day:___________

Conversion of meter into centimeters and vice versa.

We have already learned the conversion of meter into centimeter we multiply the number by 100.

Example 1: Convert 11 m to cm.

Solution:

Distance = 11 m

= (11 × 100) m

= 1100 m

Example 2: Convert 15 m 30 cm into meters.

Solution:

Distance = 15m 30 cm

= (15 × 100) cm + 30 cm

= 1500 cm + 30 cm

= 1530 cm

To convert centimeters to meters, we divide the number of centimeters by 100.

Example 3: Convert 1400 cm to m.

14 00 cm = 14 00 ÷ 100 m

$= \frac{14\ 00}{100}$ m = 14 m

Example 4: convert 2 436 cm to m and cm.

2 436 cm = 24 00 cm + 36 cm

$= \frac{24\ 00}{100}$ m + 36 cm

= 24 m + 36 cm

= 24 m 36 cm

We separate the hundred values from other to make division easy.

24 m

100⟌2436

− 24 00

36 cm

Date: ____________ Day:__________

Conversion of centimeters into millimeters and vice versa.

We have already learned the conversion of centimeter into millimeter in previous class. We multiply the number by 10.

Example 1: Convert 16 cm to mm.

Solution:

Distance = 16 cm

= (16 × 10) m

= 160 m

Example 2: Convert 25 cm 4 mm into millimeters.

Solution:

Distance = 25cm 4mm

= (25 ×10) mm + 4 mm

= 250 mm + 4 mm

= 254 mm

To convert millimeter to centimeters, we divide the number of millimeter by 10.

Example 3: Convert 350 mm to cm.

Solution:

Distance = 350 mm

= (350 ÷ 10) cm

$= \frac{350}{10}$ cm

= 35 cm

Example 4: Convert 145 mm into cm and mm

Solution:

Distance = 145 mm

= 140 mm + 5mm

= (140 ÷ 10) cm + 5 mm

= 14 cm + 5 mm

= 14 cm 5mm

Addition and subtraction in distance/length

We know the measure of length is required to know how tall a boy or a girl is or, how long the cloth is. We are also familiar with addition and subtraction of numbers. What is different about adding and subtracting lengths? The unit! Meter is the standard unit of length. If we divide the length of a meter in 100 equal parts, each part is known as a centimeter. Centimeter is also a unit to measure small lengths.

Remember to consider the unit when subtracting and adding lengths. For example, 5 meter plus 5 kilometers is not 10 meters, neither is it 10 kilometers. It is 5 kilometers and 5meters.

Let's consider some examples to understand this a little better.

Example 1: Add 3 m and 35 cm distance to 8 m and 75 cm.

Date: ____________ Day:__________

Solution:

		m		cm	
		(1) 3		(1) 3	5
+		8		7	5
	1	2		1	0

Here, 35 + 75 = 110.

As we know that 100 cm = 1m so we will split the i.e.

100 cm + 10 cm = 1m 10 cm and take 1 as carry to 3.

So, 3 m 35 cm + 8 m 75 cm=12m and 10 cm

Example 2: Subtract 4 m 80 cm from 11 m 15 cm.

		m	cm	
		⑩	⑪	
	~~1~~	~~1~~	~~1~~	5
-		4	8	0
		6	3	5

To add or subtract units of distance, always add same units. Like add km in km, m in m, cm in cm and mm in mm.

EXERCISE 5A

1. Fill in the blanks.

(1) 9 km = **9 x 1000 = 9000** m

(2) 2500 m = ______________ km

(3) 3784 m = ______________ km

(4) 3000 m = ______________ km

(5) 24 m = ______________ cm

(6) 350 cm = ______________ m

(7) 200 cm = ______________ m

(8) 4 m 58 cm = ______________ m

(9) 3 km 400 m = ______________ m

(10) 1320 cm = ______________ m

(11) 425 cm = ______________ m

(12) 250 mm = ______________ cm

(13) 500 mm = ______________ m

(14) 10 mm = ______________ cm

Date: ____________ Day:__________

1) 1 600 m 2) 8324 m

3. Convert the length in meters and centimeters.

1) 400 cm 2) 684 cm

3) 810 m 4) 205 cm

4. Convert into centimeter and millimeters.

1) 35 mm 2) 634 mm

3) 400 mm 4) 609 mm

5. Convert the following.

1) 8 km to m 2) 20 km 340 m to m

3) 4725 mm to cm and m 4) 1520 cm to cm and mm

5) 850 mm to cm 6) 15 m to cm

Date: ____________ Day:__________

7) 1 200 m to km and m

8) 35 cm to mm

6. How many meters?

1) 7000 mm

2) 5000 cm

3) 6000 mm

4) 18 km

7. Solve.

1) 428 m 15 cm + 257 m 29 cm

2) 8 m 70 cm + 5m 60 cm

3) 8 m 70 cm + 5 m 60 cm

4) 3 km 918 m + 1 km 324 m

5) 45 cm 8 mm + 65 cm 7 mm

8. Subtract.

Date: ____________ Day:__________

1) 12 km 75 m – 3 km 84 m

2) 23 cm 2 mm – 17 cm 9 mm

3) 7 km 505m – 4 km 700 m

4) 51 cm 3 mm – 27 cm 8 mm

5) 71 m 22 cm – 48 m 85 cm

Topic: Real Life Problem involving conversion, addition and subtraction of unit

EXERCISE 5 B

Solve the following word problems.

1) The length of a ribbon is 6m 80 cm. how much ribbon is left, if 2m 88cm has been cut off?

2) Jameel covered a distance of 589 m for his house to Jamia Masjid and then 868 m from Jamia Masjid to school. Find the total distance covered by him.

Date: ____________ Day:__________

Topic: Conversion of Units of Time

3) A car 1 m 62 cm wide. A garage is 2 m 41cm wide. How much space is left when the car is in the garage?

4) Naeem is 142 cm tall. His friend is 8 cm taller than him. How tall is his friend? Give the answer in meters.

5) The red part of a colour pencil is 65 mm long. The blue part is 57 mm long. What is the length of pencil? What is the answer in millimeters and centimeters?

Date: ____________ Day:__________

Let's learn:

Time is the interval between two events or the duration of an event. It is continuum (ongoing sequence) from past to present to future. Time is measured with clocks and other timing devices.

The basic unit of time is the second. There are also minutes hours, days, weeks, months and years.

Time measurement

1 hour = 60 minutes

1 day = 24 hours

1 week = 7 days

1 year = 52 weeks

1 year = 12 mounts

Read Time in Hours, Minutes and Seconds.

We have learnt each day had 24 hours. A day ends at 12 midnight and a new day begins at same time after 12 midnight.

The time between 12 midnight and 12 noon is called a.m. It means in the late night and morning.

The time between 12 noon and 12 midnight is called p.m. means in the afternoon, evening and night.

Key fact: the second is the smallest unit of time.

a.m. stands for ante meridian p.m. stands for post meridian.

Convert Hours to Minutes, Minutes to Second and vice versa.

To convert hours to minutes, we multiply the number of hours by 60.

Example1: **Convert 3 hours 20 minutes to minutes.**

Solution: 3 hours 20 minutes

= 3 hours + 20 minutes
= (3×60) minutes + 20 minutes
= 180 minutes + 20 minutes
= 200 minutes

How many seconds are there in one hour?

____

Date: ____________ Day:__________

To convert minutes into hours we divide the number of minutes by 60.

Example 2: Convert 600 minutes to hours.

Solution:

600 minutes = (600 ÷ 60) hours

$= \frac{600}{60}$ hours

$= \frac{60}{6}$ hours

= 10 hours

Example 3: Convert 400 minutes to hours and minutes

Solution:

400 minutes = 400 ÷ 60 hours

= 6 hours 40 minutes

$$\begin{array}{r} 6 \\ 60\overline{)400} \\ -\ 360 \\ \hline 40 \end{array}$$

To convert minutes to second, we multiply the number of minutes by 60.

Example 4: **Convert 5 minutes 30 seconds to seconds.**

Solution: 5 minutes 30 seconds = 5 minutes + 30 seconds
= (5 × 60) seconds + 30 seconds
= 300 seconds + 30 seconds
= 330 seconds

To convert seconds to minutes, we divided the number of seconds by 60.

Example 5: **Convert 12 minutes 45 seconds to seconds.**

Solution: 12 minutes 45 seconds = 12 minutes + 45 seconds
= (12 × 60) seconds + 45 seconds
= 720 seconds + 45 seconds
= 720 seconds

To convert seconds to minutes, we divided the number of seconds by 60.

Example 6: **Convert 660 seconds into minutes.**

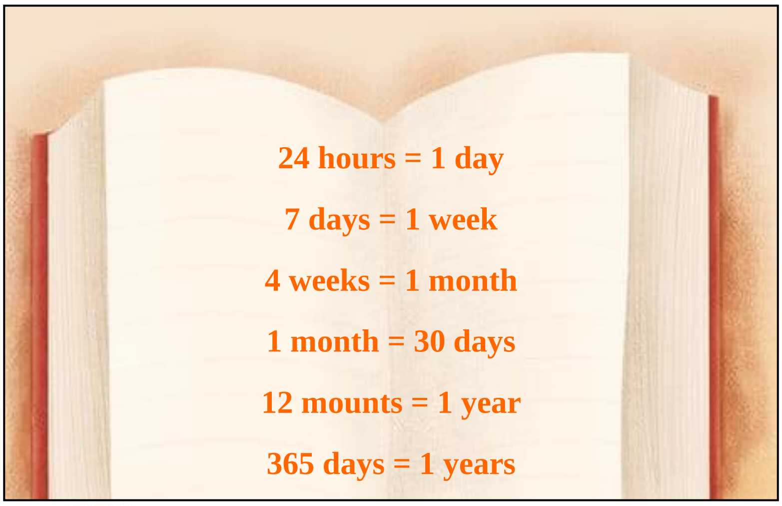
Solution: 660 seconds = (660 ÷ 60) minutes
= 11 minutes

Key fact :
1hr= 60 min
1 min = $\frac{1}{60}$ hr

Key fact :
1 min = 60 sec
1 sec = $\frac{1}{60}$ min

Date: ____________ Day:__________

Convert Years to Months, Months to Days and vice versa.



Time units are based on the period of rotation of the Earth around its own axis and around the Sun, as well as on the rotation of the Moon around the Earth. The time, during which the Earth makes a rotation around the Sun is called a year.

Month – is a time, during which the Moon makes a rotation around the Earth. The time, during which our planet makes one rotation around its axis, is called a day.
And of course, we all know that there are twelve months in a year.
There are also other periods of time. For example, a week is seven days. A decade is ten days.
A quarter is three months.
And all of the units are connected and can be converted into one another.

Convert Year to Month and Month to Year.

To convert years into months, we multiply the number of years by 12.

Example 1:

a) Convert 11 years to months

11 years = (11 ×12) months

= 132 months

b) 5 years 10 months

5 years 10 months = 5 years + 10 months

= (5× 12) months + 10 months

= 60 months + 10 months

= 70 months

To convert months to years, we divide the number of months by 12.

Example 2:

a) Convert 48 months to years

48 months = (48 ÷ 12) years

= 4 years

b) Convert 81 months to years and months.

81 months= (81÷ 12) years

= 6years 9 months

$$\begin{array}{r} 6 \\ 12\overline{)81} \\ -\ 72 \\ \hline 9 \end{array}$$

Date: ____________ Day:__________

Covert Months to Days and Days to Months

To convert months to days, we multiply the number of months by 30.

Example 3:

a) Convert 18 months to days

b) Convert 13 months 25 days to days

a)

18 months = (18 ×12) days

= 540 days

b)

13 months 25 days = 13 months + 25days

= (13 × 30) days + 25 days

= 390 days + 25 days

= 415 days

To convert days to months, we divide the number of days by 30.

Example 4:

a) Convert 150 days to months

b) Convert 244 days to months and days

a)

150 days = (150 ÷ 30) months

= 5 months

b)

244 days = (244 ÷ 30) months

= (240 ÷ 30) months + 4 days

= 8 months 4 days

$$\begin{array}{r} 8 \\ 30\overline{)240} \\ -\ 240 \\ \hline 0 \end{array}$$

Convert Days to Week and Weeks to Days

To convert weeks to days, we multiply number of weeks by 7.

Example 5: Convert 14 weeks and 2 days into days

Solution:

14 weeks and 2 days = 14 weeks + 2 days

= (14 × 7) days + 2 days

= 98 days + 2 days

= 100 days

To convert days to weeks, we divide number of days by 7.

Example 6: Convert 125 days into weeks and days

Solution:

125 days = (125 ÷ 7) weeks

= 17 weeks + 6 days

= 17 weeks 6 days

$$\begin{array}{r} 17 \\ 7\overline{)125} \\ -\ 7 \\ \hline 55 \\ -\ 49 \\ \hline 6 \end{array}$$

Date: ____________ Day:__________

Convert Hours to Days and Days to Hours

To convert days to hours, we multiply by 24. **To convert hours to days, we divide by 24.**

Example 7: Convert 5 days and 9 hours to hours

5 days and 9 hours = 5 days + 9 hours

= (5 ×24) hours + 9 hours

= 120 hours + 9 hours

= 129 hours

Example 8: Convert 76 hours to days and hours

76 hours = (76 ÷ 24) days

= 3 days and 4 hours

3
24⟌76
− 72
4

Addition and Subtraction of Time

Addition and subtraction of time is a bit different as it involves unit of time. Time is measured using different such as minutes, days, months etc. As we have developed that all of these unit are interconverting able, we will use this concept to add and subtract time.

Example 1: Add 3 hours and 55minutes and 5 hours and 40 minutes.

	h	m	
	①	⑪	
	3	5	5
+	5	4	0
	9	3	5

55 minutes + 40 minutes = 95 minutes. As 95 is greater than 60 minutes we will convert.

95 ÷ 60 = 1 hours and 35 minutes

Write 35 minutes under the minute's column and carry 1 to hour's column.

Example 2: Subtract 58 minutes 15 seconds from 72 minutes and 30 second.

	m		s	
	⑥	⑫	②	⑩
	7	2	3	0
+	5	8	1	5
	1	4	1	5

30 second – 15 second, we carry 1 from 3 to 0 and make it 10. So, 30 – 15 = 15

Similarly, 72- 58 = 14

Write 35 minutes under the minute's column and carry 1 to hour's column.

Date: ____________ Day:__________

EXERCISE 5C

1. Convert into minutes.
   1) 2 hours 2) 1 days 3 hours 3) 600 seconds

2. Convert into seconds.
   1) 5 minutes 2) 1 hours and 15 minutes 3) 1 minute and 25 second

3. Convert into hours and minutes.
   1) 1180 minutes 2) 2225 minutes

4. Convert each

1) 2185 seconds to minutes and seconds 2) 46 days to weeks and days

3) 450 days to month and days 4) 800 days into months and days

5) 49 months into years and months

Date: ____________ Day:__________

5. Add.

1) 30 minutes and 38 second to 20 minutes and 42 seconds

2) 2 hours 35 minutes to 2 hours and 40 minutes

3) 12 years and 8 months to 6 years and 10 months

4) 3 hours 55 minutes 45 seconds and 3 hours 48 minutes 44 seconds

6. Subtract.

1) 38 minutes 39 seconds from 62 minutes 20 seconds

2) 2 hours 58 minutes from 50 minutes

3) 4 years 6 months from 7 years and 3 months

Date: ____________ Day:__________

4) 3 hours 45 minutes 50 seconds from 5 hours 30 minutes 40 seconds

Topic: Real Life Problem involving conversion, addition and subtraction of units of time

Exercise# 5D

Evaluate the following word problems.

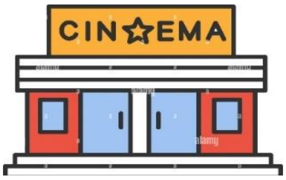
1. Umair played for 1 hours 15 minutes and Ali plays for 55 minutes. Who plays for shorter period of time and how much?

2. School closes for summer vacations for a period of 2 months and 25 days, while the other holidays are for 33 days. How many days school will remain closed?

3. A cake takes 2 hours 25 minutes to bake. If it begins baking at 1:35 p.m. at what time will the cake be done?

Date: ____________ Day:__________

4. Sarah and Malike go see a movie that lasts 2 hours 25 minutes afterwards they when shopping. If they came home after 5 hours and 10 minutes how much time they spend shopping?



5. Adil was 4 Years 2 months old when he joined the school. Today he is 11 years 1 month old. For how long has he been in school?

REVIEW EXERCISE 5

1. Tick (✓) the correct options.

1. There are _______________ meters in 2 kilometers.

a. 200 b. 500 c. 1 000 d. 2 000

2. To measure ____________ hours, minutes and second are used

a. time b. distance c. area d. length

3. There are _____________ months in $\frac{1}{2}$ years.

a. 6 b. 12 c. 9 d. 5

4. There are ____________ days in 10 months.

a. 15 b. 30 c. 45 d. 300

5. There are _____________ days in 7 weeks.

a. 7 b. 14 c. 42 d. 49

Date: ____________ Day:__________

2. Convert the following:

a) 15 km to m

b) 1020 m to km

c) 656 m into cm

d) 10 km 103 m into m

e) 40 m 66 cm into cm

f) 39 cm into mm

3. Convert the following:

a) 45 hr 66 min into min

b) 360 min into hr

c) 560 min into hr and min

d) 795 sec into min and sec

Date: ____________ Day:__________

Unit #6: Unitary Method

Learning Outcomes:

After Completing these activities, students will be able to:

- **Calculate the value of many objects of the same kind when the value of one of these objects is given.**
- **Calculate the value of one object of the same kind when value of many of these objects are given.**
- **Calculate the value of many objects of the same kind when the value of some of these is given.**

Topic: Unitary Method

Let's learn:

We use mathematics in our daily life problems, in which the price of several articles is given. We are required to find the price of some other number of articles of the same kind. We solve such problems by finding the price of one article.

The method in which the value of several articles as a unit is determined by finding the value of an article is called the unitary method.

Calculate the value of many objects of the same kind when the value of one is given

Case I: Use value of one to find value of many

Example 1: The price of a book is Rs.30. find the price of 4 such books.

Solution:

The price of one book = Rs.30

The price of 4 such books = Rs. (30×4)

= Rs. 120

To find the value of many objects we just multiply the value of one object with the required of objects.

Example 2: The price of one pencil is Rs.4.50. what is the price of 5 such pencils?

Solution:

The price of pencil = Rs.4.50

The price of 5 such pencils = Rs. (4.50×5)

= Rs. 22.50

Date: ____________ Day:__________

Case II: Use value of many objects to find value of one

Example 3: The price of 6 kg apples is Rs.240. What is the price of 1kg apples?

Solution:

The price of 6 kg apples = Rs. 240

The price of 1 kg apples = Rs. $\frac{240}{6}$

= Rs. 40

To find the value of one object when the value of many objects is given, we divide the given value of the object by the number of objects.

EXERCISE 6A

1. Fill in the blank.

1) 1 crate has 18 eggs. 8 crates will have ____________ eggs.

2) 1 box has 85 sweets. 5 boxes will have ____________ sweets.

3) 1 chair costs Rs. 210. 4 similar chairs will cost ___________.

4) 1 shelf holds 245 cans. 7 shelves will hold ________ cans.

5) 9 bags have 1,845 oranges. 1 bag will have _________ oranges.

2. Solve the following word problems.

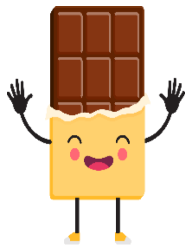
1. The price of a pen is Rs. 30. Find the price of 6 such pens.

Date: ____________ Day:__________

2. One liter of petrol price is Rs. 105.70. What is the price of 5 Liters of petrol?

3. If 12 books cost Rs. 480. What is the cost of one such book?

4. The price of 8 chocolates is Rs. 66. What is the price of 1 chocolate?

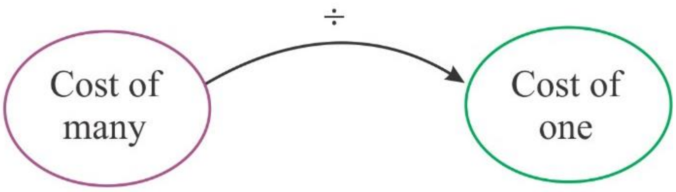


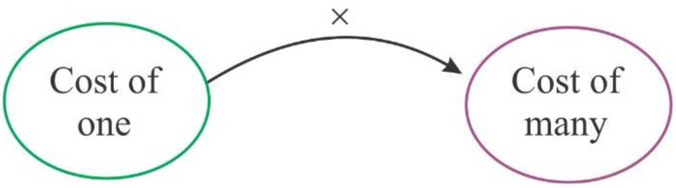
5. The price of 1kg rice is Rs.110. what is the price of 7 kg rice?

Date: ____________ Day:__________

Calculate the value of a number of same type of objects when the value of another of the same type is given:

If value of many things is given. First, we find the value of one thing and then find the value of the required number of things.





Example1: Rafay purchased 5 copies for Rs. 100. How much will he pay for 12 such copies?

Solution:

The price of 5 copies = Rs. 100

The price of 1 copy = Rs. $\frac{100}{5}$

= Rs. 20

The price of 12 copies = Rs. (20 × 12)

= Rs. 240

Hence Rafay will pay Rs. 240 for purchasing 12 such copies.

Example 2: Bismah reads 50 pages of a book in 3 hours. In how many hours can she read the book of 250 pages?

Solution:

For reading 50 pages, she takes = 3 hours

For reading of 1 page, she will take = $\frac{3}{50}$ hours

For 250 pages, she takes = $\left(\frac{3}{\cancel{50}} \times \cancel{250}\right)$ hours.

= (3 × 5) hours.

= 15 hours.

So, Bismah can read the book in 15 hours.

Date: ____________ Day:__________

EXERCISE 6 B

1. The price of 6 balls is 240 rupees. Find the price of 10 such balls.

2. 6 farmers plough a field in 10 hours. How many hours will it take for 8 farmers to plough the same field?

3. The bus fare of 10 persons from Karachi to Larkana is Rs. 8300. What is the fare for 36 persons?

4. 6 meters of cloth is required for 2 shirts. How many shirts can be made from 42 meters?

Date: ____________ Day:__________

5. The price of 2 dozen pencils is Rs. 60. What is the price of $3\frac{1}{2}$ dozen pencils?

REVIEW EXERCISE 6

1. Tick (✓) the correct options.

4. The price of a book is Rs.250, the price of 5 books will be Rs. ________.

a. 50 b. 1 000 c. d. 5

2. The price of 11 carpets is rs. 35 805, the price of 1 carpet will be Rs. ___________.

a. 2 355 b. 3255 c. 3 055 d. 3 855

4. The price of a book is Rs. 555.the price of 10 books will be Rs. _________.

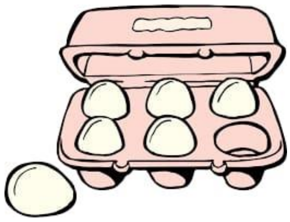
a. 2 550 b. 3 250 c. 5 050 d. 5 550

2. The cost of a sharpener is Rs. 4.50. Find the cost of adozen sharpeners.

3. From Karachi to Nawab shah the fare of 10 persons in a bus is 6500 rupees. What is the fare of each person?

Date: ____________ Day:__________

4. The cost of 2 dozen eggs is 220 rupees. What is the costof 3 dozen eggs?



5. If 10 persons can do a work in 6 days. In how many dayscan 15 persons do the same work?

6. The price of 6 packets of chalk is Rs. 90. What is theprice of 8 packets of chalk?

Date: ____________ Day:__________

Unit # 7: Geometry

Learning Outcomes:

After Completing these activities, students will be able to:

- **Recognize straight and reflex angle.**
- **Recognize the standard units for measuring angles which is 1 degree and is defined as 1/360 of a complete revolution.**
- **Identify, describe and estimate the size of angles.**
- **Classify angles as acute, right or obtuse.**
- **Compare angles with right angles and recognize that a straight line is equivalent to two right angles.**
- **Use protractor and rule to construct**
    - **A right angle**
    - **A straight angle**
    - **Reflex angles of different measures**
- **Describe adjacent, complementary and supplementary angles.**
- **Identify and describe triangles with respect to their sides.**
- **Identify and describe triangle with respect to their angles.**
- **Use protractor and rule to construct a triangle when**
    - **Two angles and their included side are given.**
    - **Two sides and included side are given.**
- **Measure the lengths of the remaining sides and angles of the triangle.**
- **Recognize the kinds of quadrilateral**
- **Identify and describe properties of quadrilaterals**
- **Use protractor and ruler to construct square and rectangle when lengths of sides are given.**
- **Recognize different types of symmetry**
- **Identify lines of symmetry for 2-D figures.**
- **Find point of rotation and order of rotational symmetry of given 2-D figures.**
- **Identify cubes, cuboids and pyramids from their nets.**

Date: ____________ Day:__________

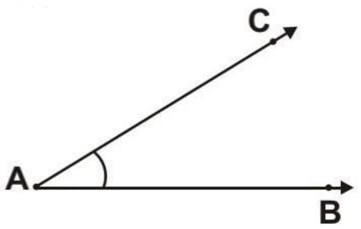
Topic: Recognize Angles

Let's learn:

We know when two rays $\overrightarrow{AB}$ and $\overrightarrow{AC}$ meet at common end point, they form angle.

Point A is called its vertex. $\overrightarrow{AB}$ and $\overrightarrow{AC}$ are called its arms or side. $\overrightarrow{AB}$ is initial arm and $\overrightarrow{AC}$ is terminal arm.

It is named as angles BAC or angle CAB. "∠" is the symbol for angle. It is written as ∠ BAC or ∠CAB.



Key fact: The measure of a complete angle in degrees is 360 degrees (also written as 360°) which is the measure of one full rotation.

A degree is a unit used to represent the measurement of an angle. There are two commonly used units of measurement of angles which are radians and degrees. In the case of practical geometry, we always measure the angle in degrees. A degree is represented by ° (degree symbol).

A protractor is generally used in schools to measure angles to solve various mathematical problems. Let us see how the symbol of degrees is used to denote the measure of an angle. Let us see a few examples to understand how the symbol of degrees is used:

30 degrees = 30°

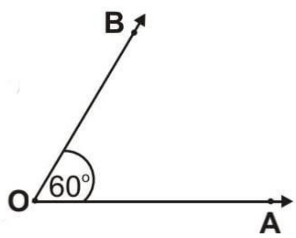
45 degrees = 45°

Kinds of an Angle:

(i) Acute angle:

An angle whose measure is less than 90° is called an acute angle. Here m∠ AOB= 60°.

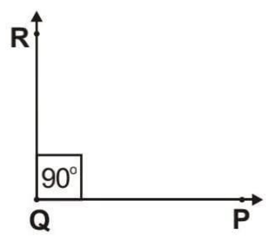
Therefore, ∠AOB is an acute angle.



(ii) Right angle:

An angle whose measure is 90°, is called right angle.

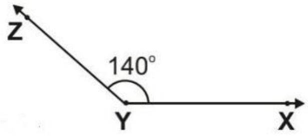
Here m∠ PQR = 90°. Therefore, ∠ PQR is a right angle.



(iii) Obtuse angle:

An angle whose measure is greater than 90° but less than 180° is called an obtuse angle.

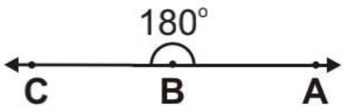
Here m∠ XYZ = 140°. Therefore ∠ XYZ is an obtuse angle.



(iv) Straight angle:

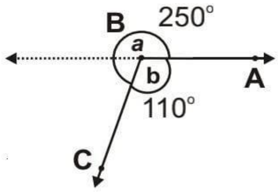
An angle whose measure is 180 is called a straight angle.

Here m∠ ABC =18. Therefore ∠ABC is a straight angle.



(v) Reflex angle:

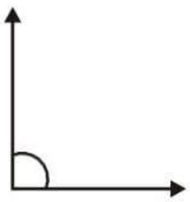
An angle whose measure is greater than 180 but less than 360 is called a reflex angle.
In the given figure m ∠ ABC =a =250.
Therefore ∠ ABC is a reflex angle.



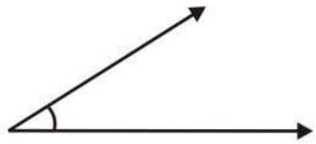
EXERCISE 7A

1. Name the angles then write their measurements.

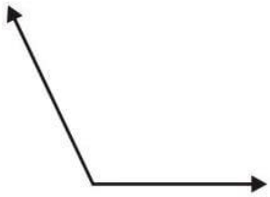
(a)



(b)



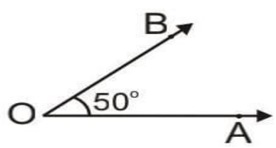
(c)



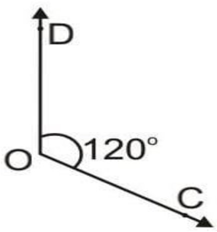
....

2. Identify the angles as acute, right, obtuse, straight and reflex angle.

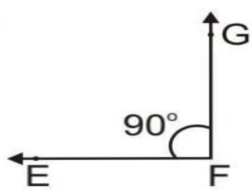
(a)



(b)



(c)



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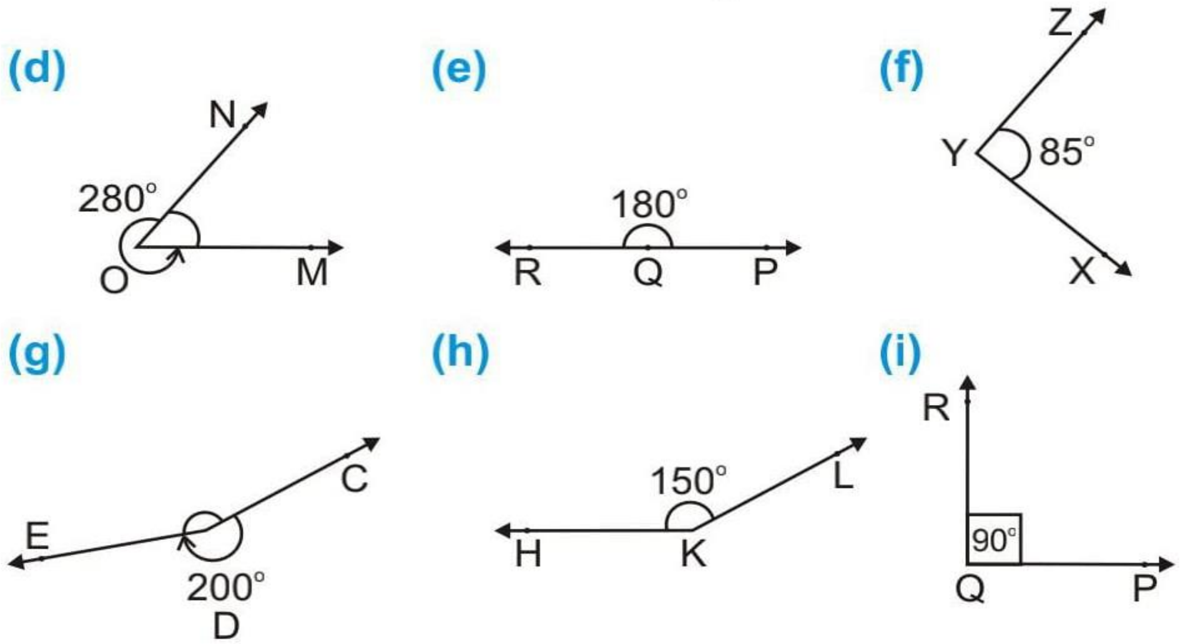


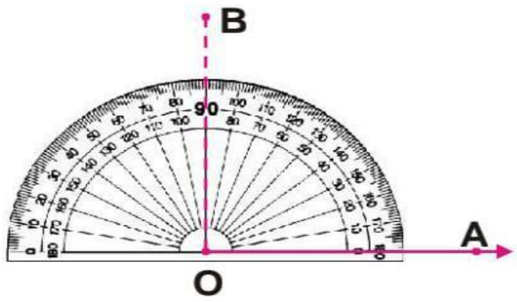
Topic: Construction of angles by using Protractor

1. To construct a right angle with the help of protractor.

Step of construction:

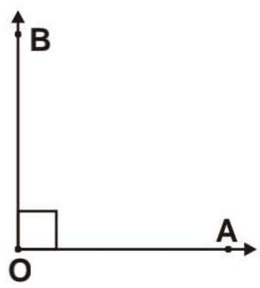
i. Draw a ray $\overrightarrow{OA}$.

ii. Place the protractor on $\overrightarrow{OA}$ such that the center point of the protractor is exactly at O and the baseline.
of the protractor is aligned with $\overrightarrow{OA}$.



iii. Read the measurement at the protractor from the side
where its zero mark lies on $\overrightarrow{OA}$.
Mark the point B at 90º.

iv. Draw $\overrightarrow{OB}$ as shown in the picture.
Thus $m\angle\ AOB\ = 90°$
and it is the required right angle.



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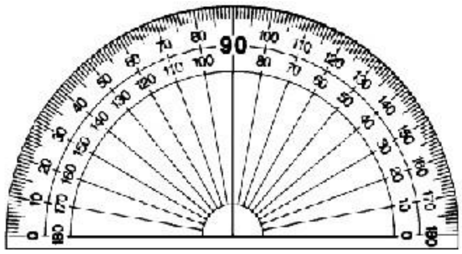
2. To construct a straight angle with the help of protractor.

Step of construction:

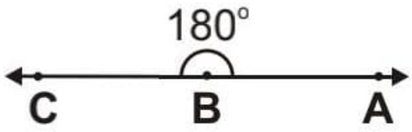


i. Draw a ray $\overrightarrow{BA}$.

ii. Place the protractor on $\overrightarrow{BA}$ such that the center point of the protractor is exactly at B and the baseline of the protractor is aligned with $\overrightarrow{BA}$.

iii. Read the measurement at the protractor from the side where its zero mark lies on $\overrightarrow{BA}$. Mark the point B at 180º.

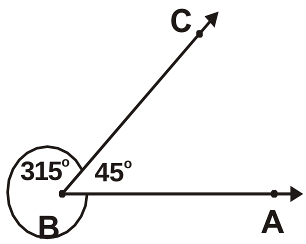
iv. Draw $\overrightarrow{BC}$ as shown in the picture. Thus $m\angle ABC = 180°$ and it is the required straight angle.



3. To construct a reflex angle with the help of protractor.

Step of construction:

Let us draw and measure a reflex angle of 315°using a protractor. We know that one complete turn = 360°.



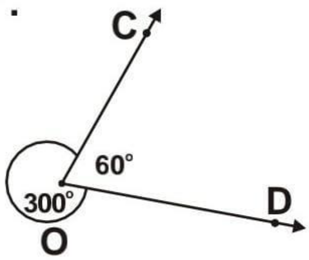
Therefore, the measure of reflex∠ABC $= 360° - 45° = 315°$. We first draw and measure the acute ∠ABC $= 45°$. Then mark the outer angle B as 315°. Thus $\angle B = 315°$ is the required reflex angle.

Example. Construct a reflex angle of 300º. Steps of construction:

We subtract the given measure of 300º from 360º i.e. 360º – 300º = 60º.

Now we draw an acute angle of 60º as to get the required reflex angle of 300º.∠COD is the required reflex angle.

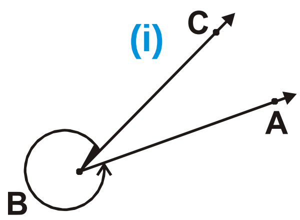
In this way we can draw a reflex angle of different measure.



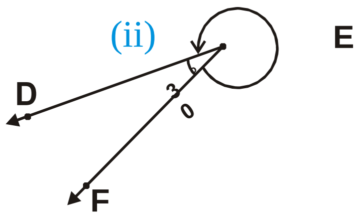
EXERCISE 7B

1. Measure the reflex angles by using protractor.

(i)



(ii)



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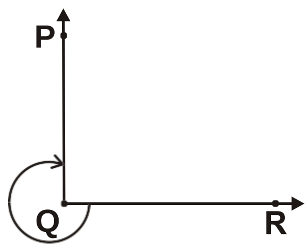
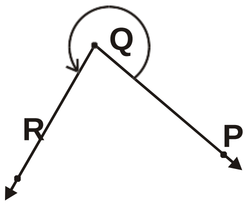
(iii)



(iv)



2. Using protractor, draw the following:

(i) Reflex $\angle ABC$ of 310°.

(ii) Reflex $\angle DEF$ of 280°.

(iii) $\angle LMN$ of 60°.

(iv) $\angle ABC$ of 45°.

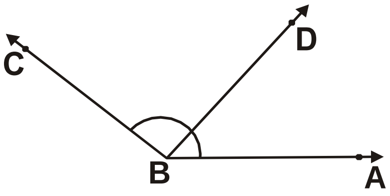
Date: ____________ Day:__________

Topic: Pairs of Angles

Let's learn:

We often come across pairs of angles that have some specialproperties. Some of them are given below:

(i) Adjacent Angles

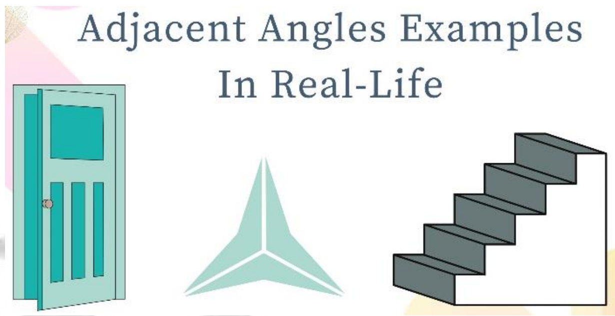


Look at the figure. We have two angles: (i) ∠ABD and (ii) ∠DBC. There is a common vertex at point B and a common arm $\overrightarrow{BD}$. The other two arms $\overrightarrow{BA}$ and $\overrightarrow{BC}$ of the angles are on the opposite sidesof the common arm $\overrightarrow{BD}$.

Two such angles: ∠ABD and ∠DBC are called adjacent angles.

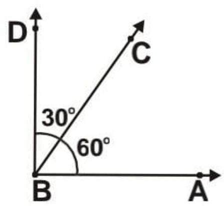
Two angles are said to be adjacent angles, if:

- They have a common vertex.
- They have a common arm.
- They are on the opposite side of the common arm.



(ii) Complementary Angles

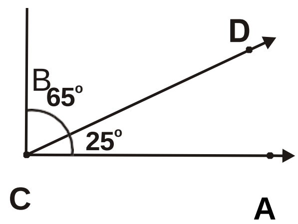
Two angles whose measures have a sum of 90^o, are called complementary angles. In figure 60^0 and 30^o are two complementary angles because $m\angle ABC + m\angle CBD = 60^O + 30^O = 90^O$.



Each angle is called a complement of the other. So, ∠ABC is complementary of ∠CBD and ∠CBD is complementary of ∠ABC.

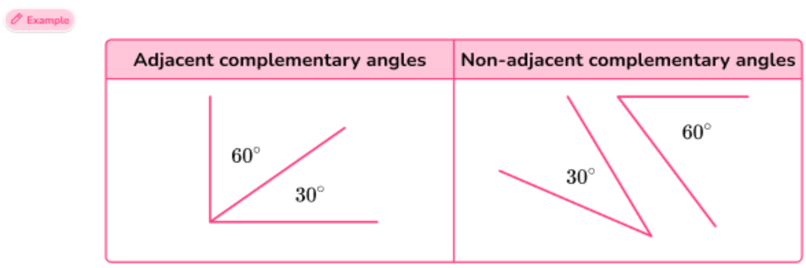
Example: Find the complementary angle of 65^O.

Solution:



m ∠BCD is 65^O, then measure of its complementary angle ∠ACD will be $90^O - 65^O = 25^O$. Because ∠BCD and ∠ACD are two complementary angles. $m\angle BCD + m\angle ACD = 65^O + 25^O = 90^O$

Complementary angles are two angles that add up to 90 degrees.
They can be adjacent or not adjacent.



Date: ____________ Day:__________

Activity 7(a)

Find complementary of m ∠DEF = 44°in the following figure.

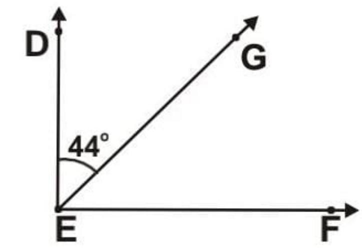
In figure, ∠DEF and ∠FEG are two complementary angles.

Therefore, m ∠DEF + m ∠FEG = ☐

m ∠DEF = 44º (given)

Hence, m ∠EFG= 90° – 44° = ☐

Thus, the complement of ∠DEF is ☐



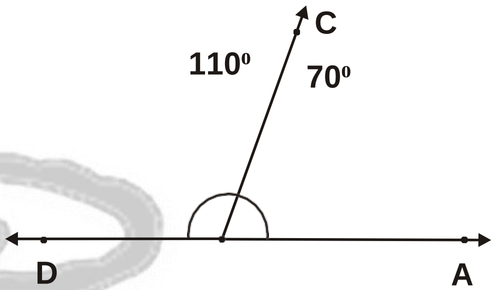
(iii) Supplementary Angles

Two angles whose measure have a sum of 180º, are called supplementary angles. In figure 70º and 110º are adjacent supplementary angles because

m ∠ABC + m ∠CBD = 110º + 70º = 180º

Each angle is called supplement of the other.

Then ∠ABC is supplement of ∠CBD,or ∠CBD is supplement of ∠ABC.



Example: Find supplement of the given angle of 120°.

Solution:

Supplement of 120° = 180° – 120° = 60°

Activity 7(b)

Find supplement of the given angle of 110°

In figure, ∠CEF and ∠DEF are two supplementary angles.

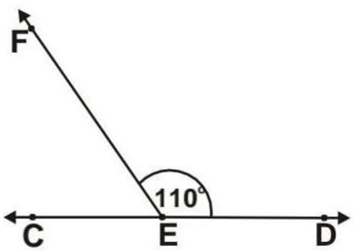
Therefore, m ∠CEF + m ∠DEF = ☐

m ∠DEF = 110º (given)

Hence, m $\angle CFE = 180° - 110° =$ ☐

Thus, the supplement of ∠DEF is ☐

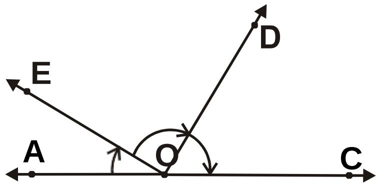
Or supplement of 110º is ☐



Date: ____________ Day:__________

EXERCISE 7C

1. Look at the figure and answer the following:



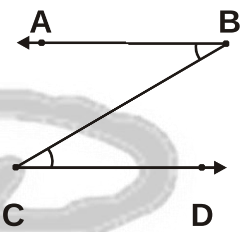
(i) Is ∠AOE adjacent to ∠DOE?

(ii) Is ∠AOD adjacent to ∠COD?

(iii) Is ∠AOE adjacent to ∠AOD?

(iv) Is ∠DOE adjacent to ∠EOC?

2. Is ∠ABC adjacent to ∠BCD?
Why or why not?



3. Find the complement of each of the following angles:

(i) 60° (ii) 76° (iii) 45° **(i)** 38° **(ii)** 15°

4. Find the supplement of each of the following angles:

(i) 25° (ii) 45° (iii) 70° (iv) 98° (v) 143°

Date: ____________ Day:__________

5. Identify which of the following pair of angles are complementary and which are supplementary.

(i) $49^o, 41^o$ (ii) $154^o, 26^o$ (iii) $95^o, 85^o$

(iv) $32^o, 58^o$ (v) $111^o, 69^o$ (vi) $14^o, 76^o$

6. (i) Find the angle which is equal to its complement.

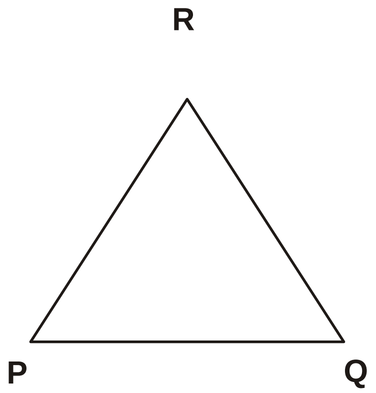
(ii) Find the angle which is equal to its supplement.

7. Can two angles be supplementary, if both of them are:

(i) Obtuse (ii) Acute (iii) Right

Date: ____________ Day:__________

Topic: Triangle



Definition of a triangle:

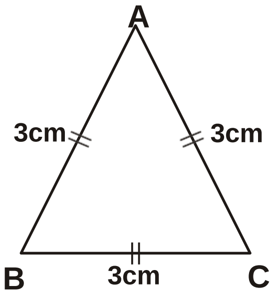
Triangle is a plane closed figure with three sides. The symbol of triangle is Δ. Given figure is ΔPQR. Points P, Q and R are three vertices. $\overline{PQ}$, $\overline{QR}$ and $\overline{RP}$ are three sides. ∠PQR, ∠QRP and ∠RPQ are three angles.

Sum of all three angles of a triangle is equal to 180^{o}.

Types of Triangles with respect to their sides

According to the sides of a triangle, there are three types of a triangle.

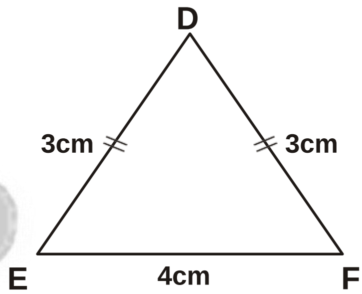
(i) **Equilateral Triangle**



It is a triangle having three sides equal in length. ΔABC is an equilateral triangle.

$\therefore$ m $\overline{AB}$ = m$\overline{BC}$ = m $\overline{CA}$

(ii) **Isosceles Triangle**

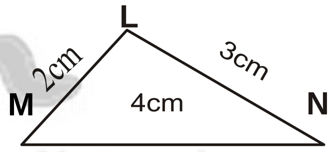


It is a triangle having two side equal. ΔDEF is an isosceles triangle.

$\therefore$ m $\overline{DE}$ = m$\overline{DF}$

(iii) **Scalene Triangle**

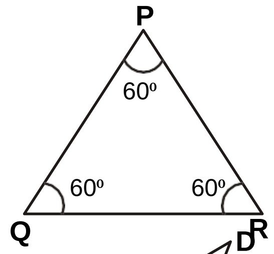
It is a triangle of different all sides in length. ΔLMN is scalene triangle. Because m $\overline{LM}$ ≠ m $\overline{MN}$ ≠ m$\overline{LN}$.



Types of Triangles with respect of their angles

According to the angles of a triangle, there are three types of a triangle.

(1) **Acute-angled Triangle**

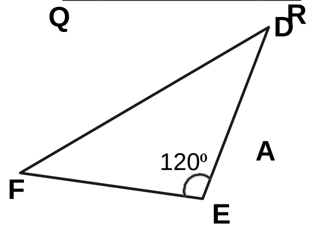


If all three angles of a triangle are acute angles, then the triangle is called an acute angled triangle. ΔPQR is an acute angled triangle, in which ∠P, ∠Q and ∠R are acute angles.

(2) **Obtuse-angled Triangle**

If one angle of a triangle is an obtuse angle, then the triangle is called an obtuse angled triangle.

ΔDEF is an obtuse angled triangle, in which ∠DEF is an obtuse angle.



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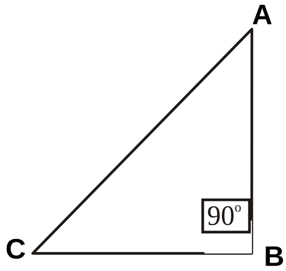
(3) **Right-angled Triangle**



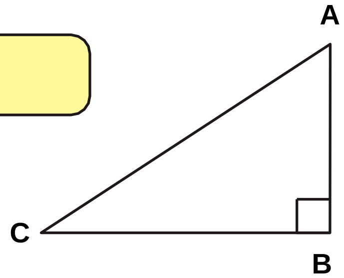
If one angle of a triangle is a right angle, then the triangle is called right angled triangle.

ΔABC is a right-angled triangle, in which m $\angle ABC = 90^{o}$

Define Hypotenuse of a right-angled triangle.

In a right triangle, the side opposite to the right angle is called hypotenuse.

In figure, $\triangle ABC$ is a right triangle, where $\angle$ B is a right angle.



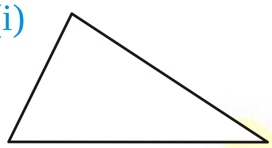
Note: Hypotenuse is the longest side in a right-angled triangle.

AC or $\overline{CA}$ is hypotenuse, as it is opposite to right angle B.

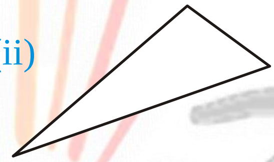
EXERCISE 7D

1. Measure the sides of the following triangles and thenwrite their names.

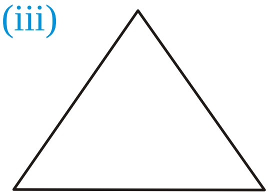
(i)



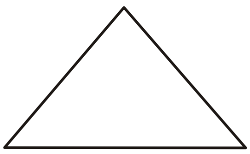
(ii)



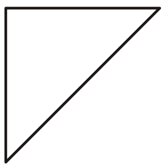
(iii)



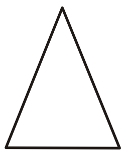
(iv)



(v)



(vi)



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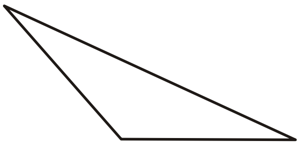
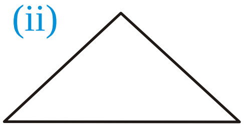
2. Use protractor, measure the angles of the following triangles and write their names.

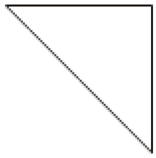
(i)



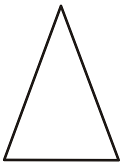
(ii)



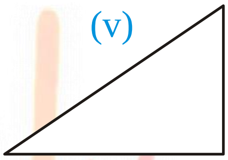
(iii)



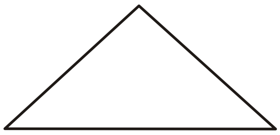
(iv)



(v)



(vi)



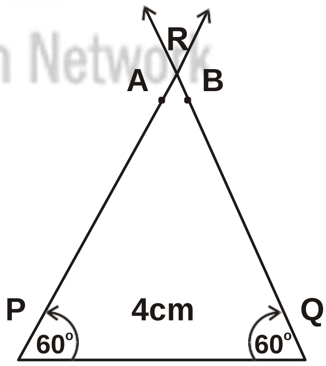
Topic: Construction of Triangle

Use a protractor and ruler to construct a triangle, when two angles and included side are given.

We use the following steps given in the examples.

Example 1: Construct an equilateral triangle when

$m\angle PQR = 60^0 = m\angle QPR$ and $m\overline{PQ} = 4cm$



Steps of construction:

Step I: Draw a line segment PQ by measuring 4cm from ruler.

Step II: Place the central point of the protractor at point P in such a way that PQ coincides the base line of the protractor. Read from Q and mark point A at 60º.

Step III: Place the central point of the protractor at point Q read from P and mark point B at 60º.

Step IV: From point P and Q segment draw the ray $\overrightarrow{PA}$ and $\overrightarrow{QB}$ So that the rays intersect each other at point R. Now Δ PQR is the required triangle.

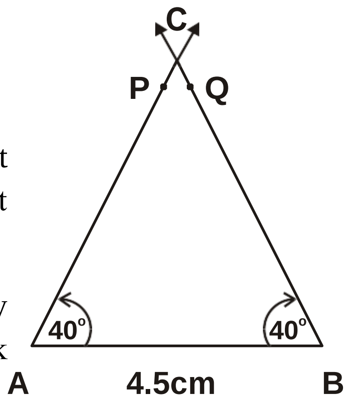
Step V: Measure the sides PR and QR and ΔPQR.
Thus $m\overline{PR}$ = 4cm, $m\overline{QR}$ = 4 cm and $m\angle PRQ = 60^o$.Hence ΔPQR is the required equilateralΔ.

Date: ____________ Day:__________

Example 2: Construct an isosceles $\Delta ABC, where\ m\overline{AB} = 4.5\ cm, m\ \angle ABC = m\ \angle CAB = 40^{o}$.

Given: Two angles of equal measured and one side is given.

Steps of construction:



Step I: Draw $\overline{AB}$ of measure 4.5 cm.

Step II: Place the central point of the protractor at point A in such a way that $\overline{AB}$ coincides the base line of the protractor. Read it up to 40º and mark at point P.

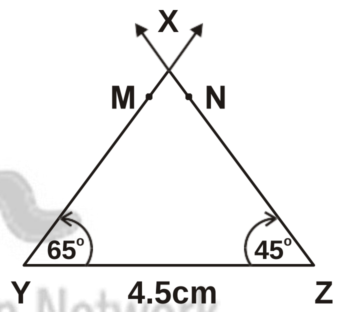
Step III: Place the central point of the protractor at point B in such a way that $\overline{AB}$ coincides the base line of the protractor. Read it up to 40º and mark it point Q.

Step IV: From points A and B, draw $\overrightarrow{AP}$ and $\overrightarrow{BQ}$ to intersect each other at a point.

Step V: Mark the point as C. In this way, we get an isosceles triangle ABC. Now measure the remaining two sides $\overline{AC}$ and $\overline{BC}$ with the help of ruler. Also measure third angle ACB with the help of protractor.

Example 3: Construct a scalene $\Delta XYZ, when\ m\angle XYZ = 65^{o} m\ \angle XZY = 45^{o}\ and\ m\overline{YZ} = 5.4cm$.

Steps of construction:



Step I: With the help of ruler and pencil draw $\overline{YZ}$ of 5.4cm in the length.

Step II: Place protractor at point Y. Read it and mark point up to 65º and mark it as M.

Step III: From point Z, read the protractor up to 45º and mark at a point N.

Step IV: Through points Y and Z, draw $\overrightarrow{YM}$ and $\overrightarrow{ZN}$ to intersect each other at point X.

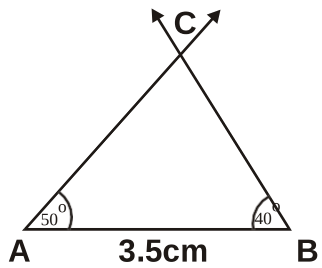
Step V: Measure XY, XZ and ΔYXZ

mXY =_______cm, mXZ =______cm and m∠YXZ = 70º

Thus ΔXYZ is the required scalene triangle.

Date: ____________ Day:__________

Example 4: Construct a right angled ΔABC, where m ∠ BAC = 50°,m ∠ ABC = 40° and m AB = 3.5 cm



Steps of construction:

Step I: Draw $\overline{AB}$ of measure 3.5 cm.

Step II: Take point A as center, draw∠BAC of measure 50°.

Step III: Take point B as center, draw∠ ABC of measure 40°.

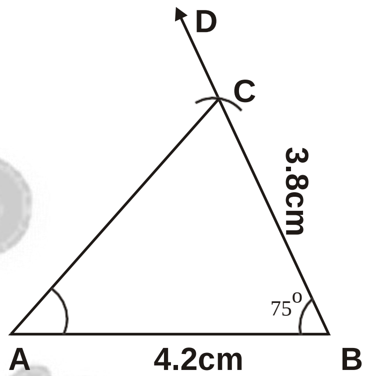
Step IV: The point where arms of both the angles meet at point C, form right angle.

Thus, ABC is the required right angled triangle.

Use a protractor and ruler to construct a triangles, when one angle and adjacent sides are given.

Example 1: Construct an acute angled ΔABC $where\ m\ \angle ABC = 75°, m\ \overline{AB} = 4.2\ cm\ and\ m\ \overline{BC} = 3.8\ cm.$

Steps of construction:



Step I: Draw AB of measuring 4.2 cm.

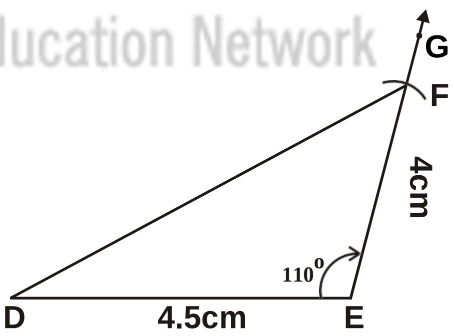
Step II: Using protractor make ∠ ABD measuring 75°.

Step III: From point B, draw an arc of 3.8 cm to cut the arm $\overrightarrow{BD}$ at point C.

Step IV: Draw AC. We get the required acute angled △ABC.

Example 2: Construct an ΔDEF $where\ m\ \angle DEF = 110°, m\ \overline{DE} = 4.5\ cm\ and\ m\ \overline{EF} = 4\ cm$

Steps of construction:



Step I: Draw DE of measuring 4.5 cm

Step II: Using protractor make ∠ DEG measuring 110°

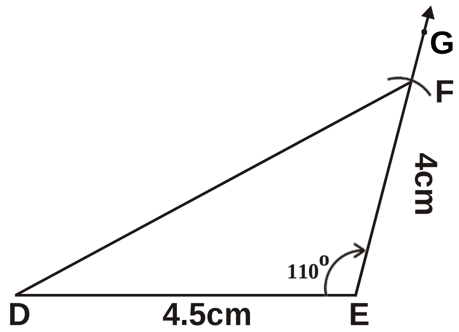
Step III: Use pair of compasses, select E as center and draw arc of 4 cm radius to cut the arc EG at point F. Use scale and draw DF, which is the third side of the △DEF.

Step IV: Thus, we get the required ΔDEF.

Example 3: Construct a right-angled triangle with $sides\ m\overline{DE} = 5.2\ cm, m\overline{EF} = 4.3\ cm\ and\ m\angle DEF = 90°.$

Date: ____________ Day:__________

Steps of construction:



Step I: Draw DE of measuring 4.5 cm

Step II: Using protractor make ∠ DEG measuring 110º

Step III: Use pair of compasses, select E as center and draw arc of 4 cm radius to cut the arc EG at point F. Use scale and draw DF, which is the third side of the △DEF.

Step IV: Draw DF by joining the points D and F. Thus, △DEF is the required right angled triangle.

EXERCISE 7 E

1. Using a ruler and a pair of compasses, construct the following equilateral triangles.

I. ΔABC where $m\overline{AB} = m\overline{BC} = m\overline{CA} = 4$ cm.

II. ΔDEF where $m\overline{DE} = m\overline{EF} = m\overline{DF} = 3.5$ cm.

III. ΔPQR where $m\overline{PQ} = m\overline{QR} = m\overline{PR} = 5.2$ cm.

Date: ____________ Day:__________

2. Using a ruler and a pair of compasses, construct the following isosceles triangle

(i) ΔABC where $m\overline{AB} = m\overline{BC} = 6$ cm; $m\overline{AC} = 4$ cm.

(ii) ΔDEF where $m\overline{DE} = 2.5$ cm, $m\overline{EF} = m\overline{DF} = 4$ cm.

(iii) ΔPQR where $m\overline{PQ} = 4$ cm, $m\overline{QR} = m\overline{PR} = 3.5$ cm.

3. Using a ruler and a pair of compasses, construct the following scalene triangles.

(i) ΔABC where $m\overline{AB} = 4.8$ cm, $m\overline{BC} = 3$ cm and $m\overline{AC} = 5$ cm.

Date: ____________ Day:__________

(ii) ΔPQR where $m\overline{PQ} = 4.5$ cm, $m\overline{QR} = 5$ cm and $m\overline{PR} = 3.5$ cm.

(iii) ΔEFG where $m\overline{EF} = 5.2$ cm, $m\overline{FG} = 4.4$ cm and $m\overline{GE} = 3$ cm.

4. Using ruler, protractor and a pencil to construct the following equilateral, isosceles and scalene triangles. Also measure the remaining two sides and one angle in each triangle.

(i) An equilateral ΔABC where $m\overline{AB} = 5.7$ cm, $m\angle ABC = m\angle BAC = 60°$.

(ii) An isosceles ΔLMN where $m\overline{LM} = 5$ cm, $m\angle LMN = m\angle MLN = 70°$.

(iii) A scalene ΔXYZ where $m\overline{XY} = 6\text{ cm}, m\angle XYZ = 60°;\ m\angle YXZ = 50°$.

(iv) An equilateral ΔRST where $mRS = 4.8\text{ cm}$ and $m\angle RST = m\angle TRS = 60^\circ$.

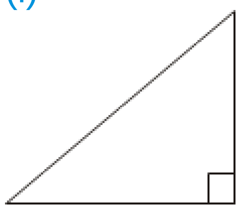
(v) A scalene ΔEFG where $mEF = 5.5\text{ cm}, m\angle EFG = 75°$ and $m\angle GEF = 65°$.

Date: ____________   Day:__________

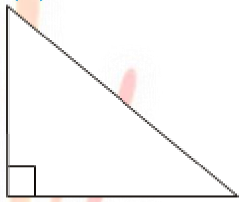
(vi) $An\ isosceles\ \Delta JKL\ where\ m\angle JLK = 45^{o}.\ m\overline{JL}\ \ 4.6\ cm\ \ and\ m\angle KJL = 45^{o}.$

5. Look at the following right- angled triangles. Name and measure the hypotenuse in each triangle.

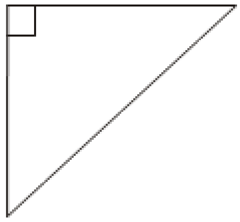
(i)



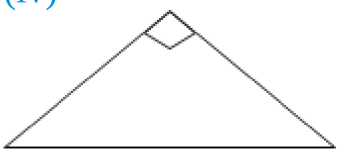
(ii)



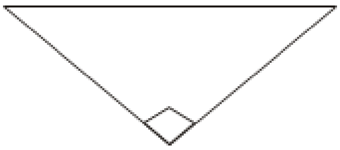
(iii)



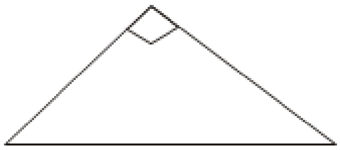
(iv)



(v)



(vi)



6. Using a ruler and protractor to construct the following triangles. Measure the length of remaining two sides and one angle of the triangle.

(i) ΔABC where
m AB = 5 cm,
$m\angle$ BAC = 55^{o},
$m\angle$ ABC = 35^{o}

(ii) ΔJKL where
$m\angle$ KJL = 65^{o},
$m\angle$ JKL = 25^{o},
m JK = 4.8 cm

Date: ____________ Day:__________

(iii) ΔPQR where

$m\angle QPR = 30^\circ$

$m\angle PQR = 60^\circ$,

$m\,QP = 4$ cm

(iv) $\triangle$STU where

$m\,ST = 5.3$ cm, $m\angle STU = 75^\circ$

$m\angle TSU = 15^\circ$

7. Use protractor, a pair of compasses and ruler to construct the following triangles:

(i) Acute angled ΔABC, when $m\angle BAC = 65^\circ$, $m\,AB = 3.6$ cm and $m\,AC = 4.4$ cm.

(ii) Right angled Δ DEF, when $m\angle DEF = 90^\circ$, $m\,DF = 3$ cm and $m\,EF = 4$ cm.

Date: ____________ Day:__________

(iii) Obtuse angled ΔLMN, m NML = 110o, m MN = m ML = 5 cm.

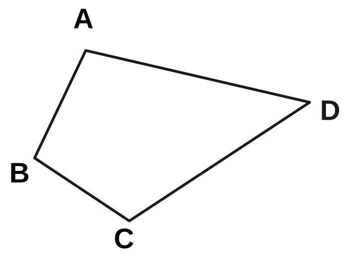
(iv) Acute angled ΔPQR, $m\angle PQR = 60^{\circ}$, m PQ = mQR = 4 cm.

(v) Right angled ΔXYZ, when $m\angle XYZ = 90^{\circ}$, m XY = 4.2 cm = mYZ

(vi) Obtuse angled Δ STU, when $m\angle STU = 120^{\circ}$, m ST = 3.6 cm and m TU = 4.2 cm.

Date: ____________ Day:__________

Topic: Quadrilaterals



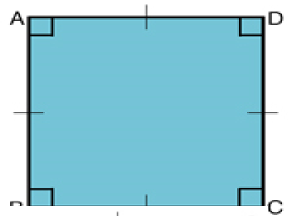
A closed figure with four sides is called a quadrilateral.

In the figure, quadrilateral ABCD has four sides $\overline{AB}$, $\overline{BC}$, $\overline{CD}$ and $\overline{AD}$. It has four angles $\angle A, \angle B, \angle C$ and $\angle D$.

The sum of measure all four angles of quadrilateral is equalto 360^{o}.

Types of Quadrilaterals:

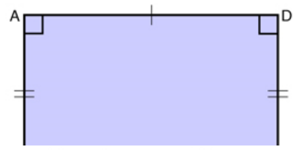
There are various types of Quadrilaterals, which are:



Square

A quadrilateral that has all sides equal and opposite sides parallel and all interior angles equal to 90° is called a square.

As ABCD is a square. AB = BC = CD = DA.

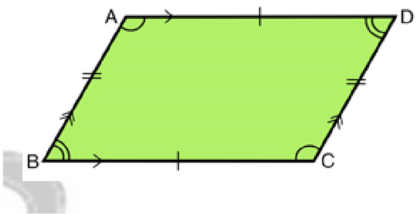


Rectangle

Rectangle is a quadrilateral whose opposite sides are equal and parallel and all the interior angles equal to 90°.

As, ABCD is a rectangle =AB = CD, AD = CD

$$AB \parallel CD, AD \parallel BC$$

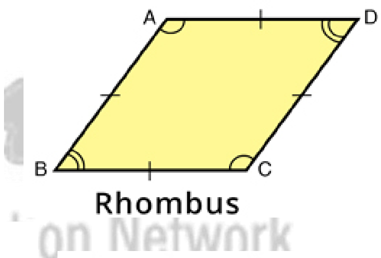


Parallelogram

Parallelogram is a quadrilateral whose opposite sides are equal and parallel. Opposite angles of a Parallelogram are equal, but none of the angles is a right angle.

As, ABCD is a Parallelogram =AB = CD, AD = CD

$$AB \parallel CD, AD \parallel BC$$

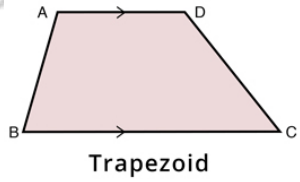


Rhombus

Rhombus is a quadrilateral that has all sides equal and opposite sides parallel. Opposite angles of a rhombus are equal, but none of the angles is a right angle.

As, ABCD is a Rhombus =AB = CD, AD = CD

$$AB \parallel CD, AD \parallel BC$$

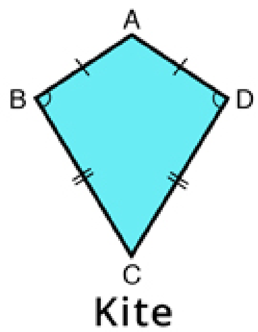


Trapezium

A trapezium is a quadrilateral that has one pair of opposite sides parallel.

In a regular trapezium, non-parallel sides are equal, and its base angles are equal.

As ABCD is a Trapezium$AD \parallel BC$.



Kite

Kite has two pairs of equal adjacent sides and one pair of opposite angles equal. Diagonals of kites intersect perpendicularly.

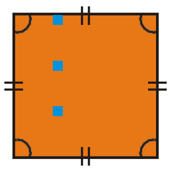
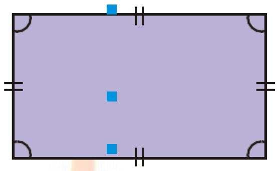
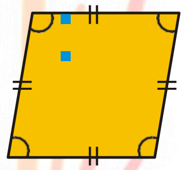
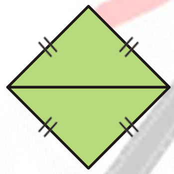
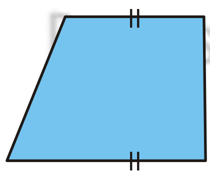
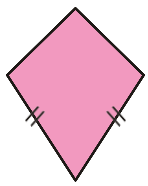
As, ABCD is a kite.

AB = AD, BC = CD

Date: ____________ Day:__________

Recognize the kinds of quadrilateral.

The kinds of a quadrilateral are:

Quadrilateral	Figure	Properties
Square		All the four sides are equal Opposite sides parallel Each angle is of 90°
Rectangle		Opposite sides equal Opposite sides are parallel Each angle is of 90°
Parallelogram		Opposite sides equal Opposite sides are parallel Opposite angles are equal. None of angle measure 90°
Rhombus		Four equal sides Opposite sides are parallel Opposite angles are equal. None of angle measure 90°
Trapezium		Only one pair of opposite parallel sides
Kite		Two pairs of adjacent equal sides Here one pair of equal angles

Date: ____________ Day:__________

Construction of a square and rectangle with given sides.

Example 1: With the help of ruler and protractor construct a square of sides 2.5 cm.

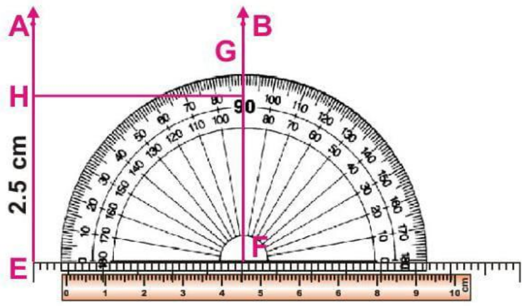
Steps of construction:

Step I: Use ruler, draw EF of 2.5 cm.

Step II: At point F, draw ∠EFB = 90º with the help of protractor.

Step III: Using ruler cut FB such that FG of 2.5 cm

Step IV: At point E, draw ∠FEA = 90ºwith the help of protractor.

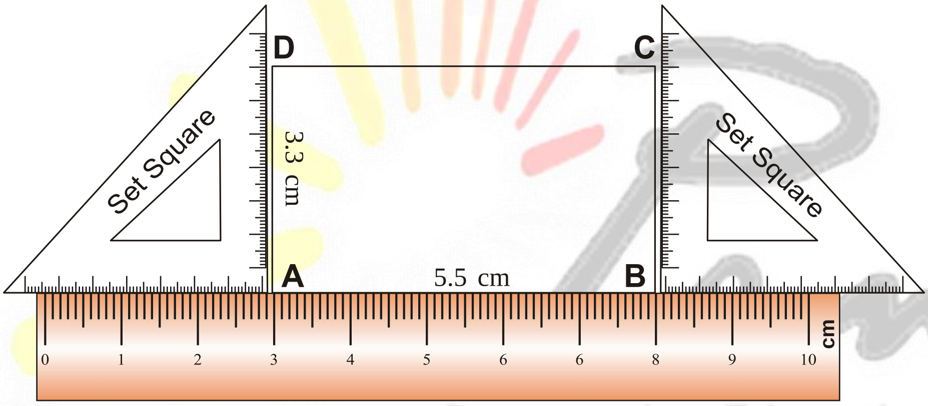


Step V: Using ruler, cut EA such that EH of 2.5 cm.

Step VI: Draw GH by joining the points G and H i.e. draw GH of 2.5 cm.

Hence quadrilateral EFGH is the required square.

Example 2: To construct a rectangle of which the length is 5.5 cm and breadth is 3.3 cm.



Steps of construction:

Step I: Use ruler, draw AB of 5.5 cm length.

Step II: Place both set squares on AB, such that their right-angled perpendicular sides are parallel to each other.

Step III: With the help of set squares, construct a perpendicular at point A. cut it 3.3 cm and mark it point D.

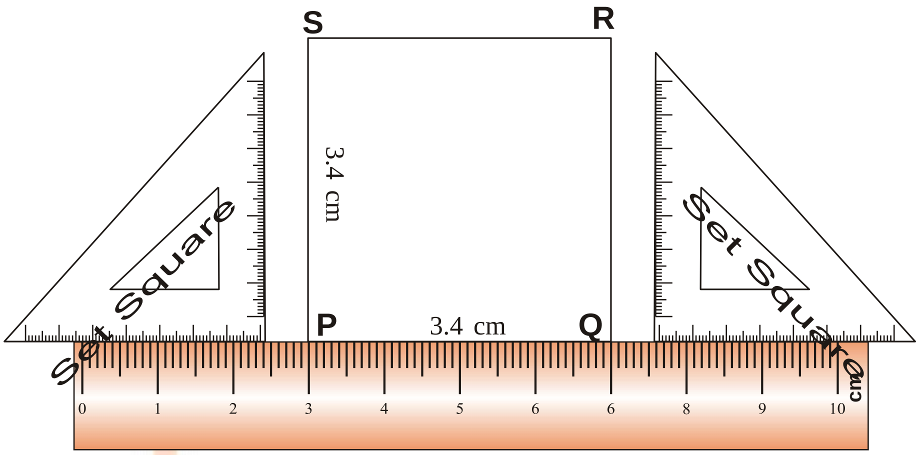
Step IV: Construct perpendicular with the help of set squares at point B. Draw another perpendicular BC and cut it 3.3 cm length and mark it point C.

Step V: Join point C and D with the help of ruler and draw CD.

Thus, quadrilateral ABCD is the required rectangle.

Date: ____________ Day:__________

Example 3: Construct a square of which the length of a sides 3.4 cm with the help of ruler and a set square.



Steps of construction:

Step I: Use ruler, draw PQ = 3.4 cm long.

Step II: Place both set squares on PQ, such that their right-angled perpendicular sides are parallel to each other.

Step III: With the help of set square, draw a perpendicular on point P. Measure it 3.4 cm and mark it as point S.

Step IV: Construct another perpendicular at point Q. Cut it 3.4 cm and mark it point R.

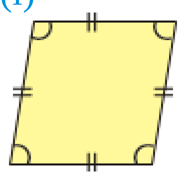
Step V: Use ruler, join point R and S then draw RS = 3.4 cm long.

Thus, quadrilateral PQRS is the required square.

EXERCISE 7 F

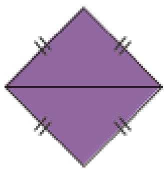
1 Recognize the names and give the answers of thefollowing for each quadrilateral.

(i)



Sides__________names ________

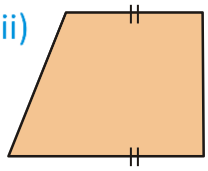
(ii)



Angles________names _________

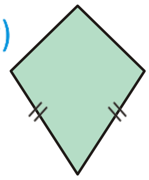
Date: ____________ Day:__________

(iii)



Vertex __________Sides _________

(iv)



Measurement of each angle ________________

2 Construct rectangle with sides given below with the help of a ruler and a protractor.

(i) 4 cm, 3cm

(ii) 6 cm, 3.5 cm

(iii) 5.5 cm, 2.8 cm

(ii) 6 cm, 3.4 cm

Date: ____________ Day:__________

3 Construct a square with a side given below with the help of a ruler and a protractor.

(i) 3cm (ii) 4 cm (iii) 5.4 cm

4 Construct rectangles with sides given below with the help of a ruler and set squares.

(i) 3cm, 4cm (ii) 4 cm, 3cm (iii) 4.6 cm, 3.5cm

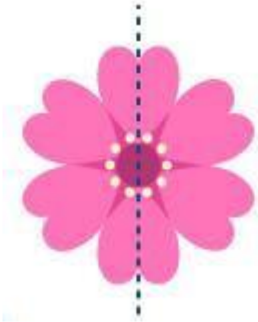
5 Construct a square with a side given below with the help of a ruler and a set squares.

(i) 4cm (ii) 5 cm (iii) 4.4cm

Date: ____________ Day:__________

Topic: Symmetry

Reflection symmetry

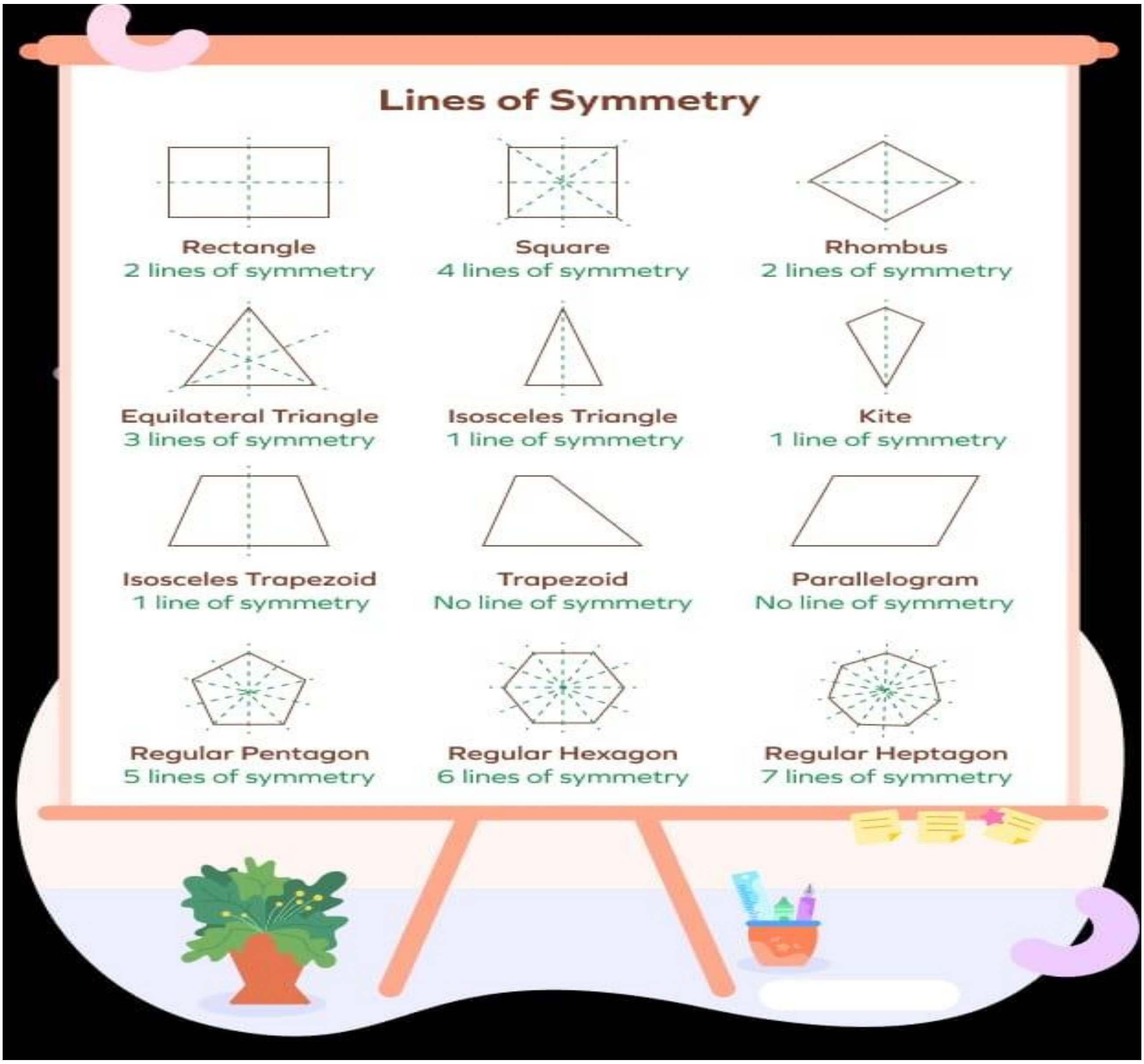


An object is said to have symmetry if it can be divided into two identical halves. The line that divides the object into its identical halves is called the line of symmetry. For example, in the given image, the line passing through the middle of the flower is its line of symmetry.

The symmetry of figure about its line of symmetry may be tested by folding it along that line. If the figure is symmetrical the part will fit exactly on top of each other. This is called reflection symmetry.

A figure can have more than one line of symmetry of symmetry.

For example, look at the following figure

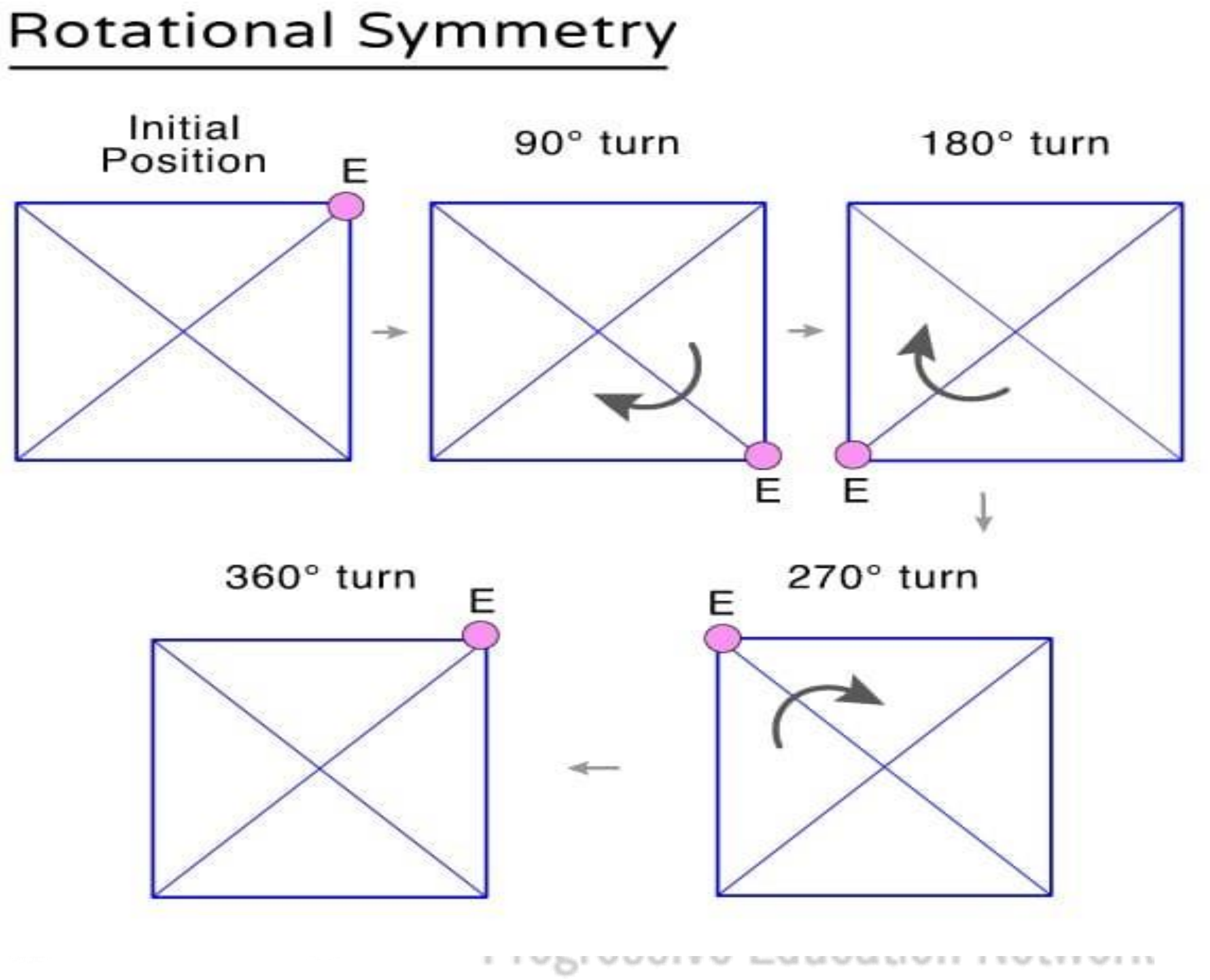


Date: ____________ Day:__________

Rotational symmetry

A shape is said to have a rotational symmetry if, after its rotation, it looks the same.

An object when rotated in a particular direction, around a point is exactly similar to the original object is known to have rotational symmetry. A complete revolution has 4 rotations of 90º.



We can see that when it is rotated around its center, it is at an angle of 90º looks exactly the same 4 times. It means it has a rotational symmetry and the order of its rotational symmetry is 4.

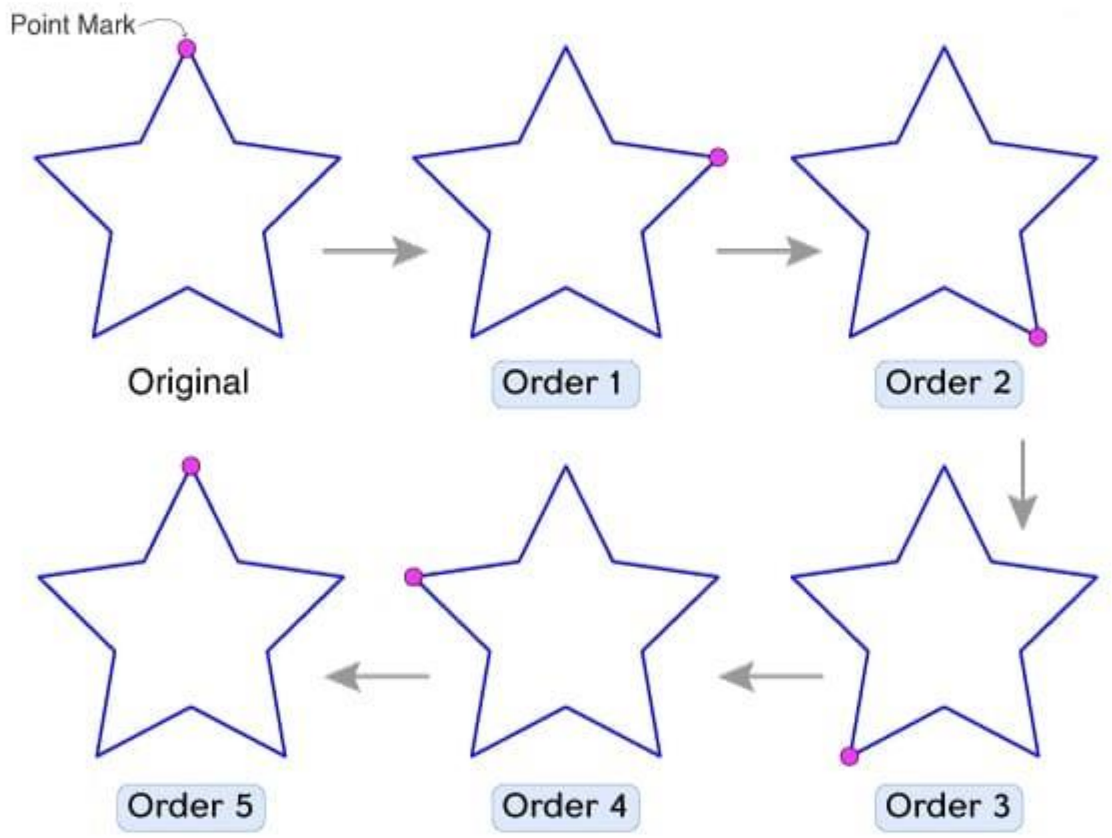
Order of Rotational Symmetry

Order (or degree) of rotational symmetry is the number of times a shape can be rotated about its center to keep the look exactly the same as it was before the rotation.

Date: ____________ Day:__________

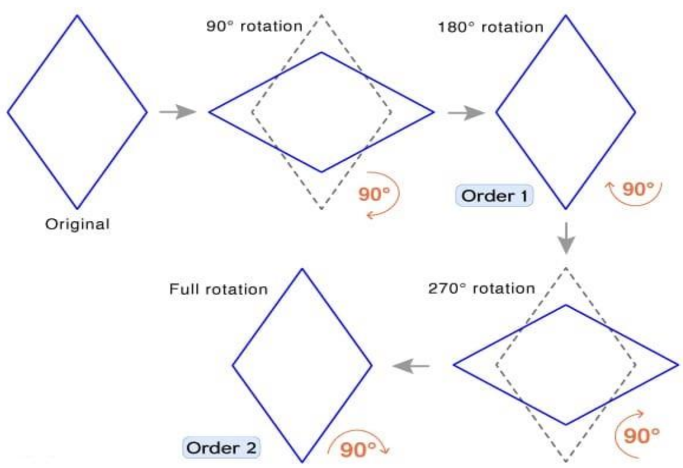
Example1: What is the order of rotational symmetry of a star?

Solution:



We can see that when the shape is rotated about its center it looks exactly the same five times. It means it has a rotational symmetry of 5.

Activity 7(c) **What is the order of rotational symmetry of a rhombus?**



We can see that when the shape is rotated about its center, it looks exactly the same ☐. It means it has a rotational symmetry of order ☐.

Date: ____________ Day:__________

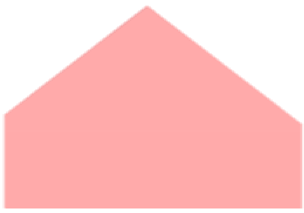
EXERCISE 7 G

1. Each of these shapes have one line of symmetry draw the line of symmetry in each.

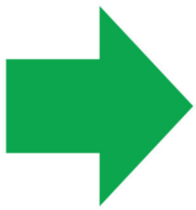
(i)

(ii)

(iii)



(iv)



2. Each of these shapes have two lines of symmetry draw the lines of symmetry in each.

(i)

(ii)

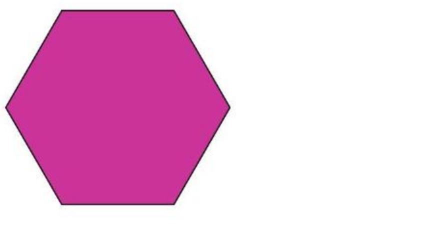
(iii)

(iv)

3. Write down the number of lines of symmetry for each of these shapes.

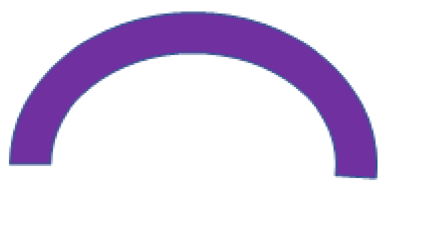
(i)

(ii)



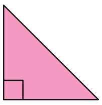
(iii)

(iv)

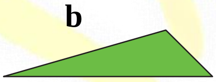


1.Complete the table for these triangles. The first one is done for you.

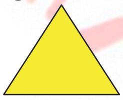
a



b



c



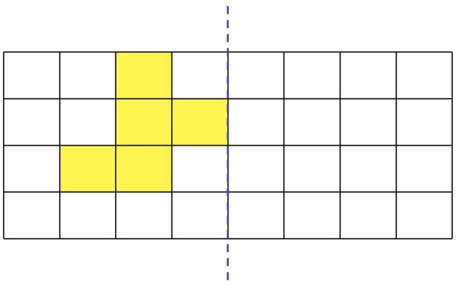
d

e

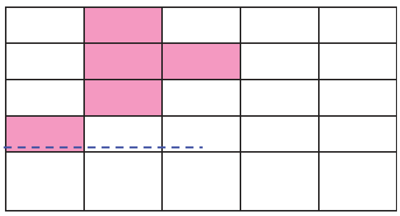
	Type of triangle				Number of lines of symmetry
	Isosceles	Equilateral	Scalene	Right-angled	
a	√			√	1
b					
c					
d					
e					

2. Draw the other half of each symmetrical shape.

a

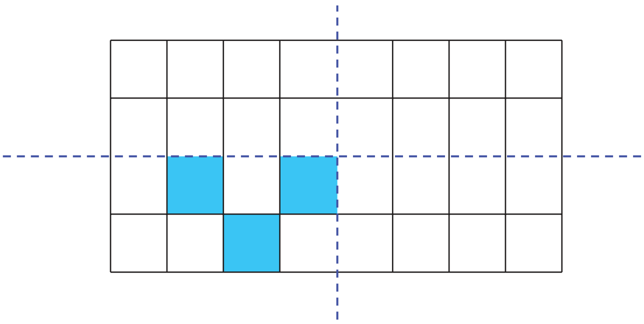


b



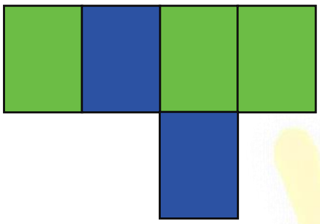
Date: ____________ Day:__________

c

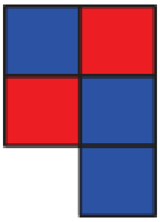


3.Look at these patterns. Add one blue square to each pattern to make a new pattern that has a line of symmetry. Draw the line of symmetry onto each of your patterns.

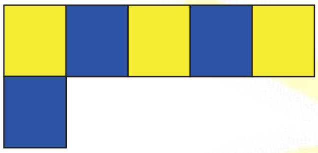
i



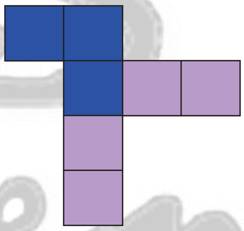
ii



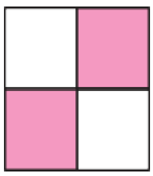
iii



iv



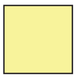
4.Sofi has a box of tiles. All the tiles have the same pattern. This is what one of the tiles looks like. Sofi uses four of the tiles to make a square pattern that has four lines of symmetry. Draw two different patterns that Sofi could make.



Date: ____________ Day:__________

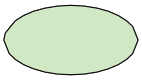
5. Write down the order of rotational symmetry of these shapes.

a



____

b

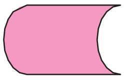


____

c

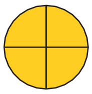
____

d



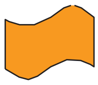
____

e



____

f



____

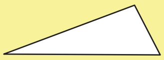
6. Sort these cards into their correct groups. Each group must have one blue, one green and one yellow card.

A Rectangle

a Order of rotational symmetry is 3

B Scalene triangle

i



b Order of rotational symmetry is 2

C Equilateral triangle

ii

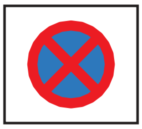
iii

c Order of rotational symmetry is 1

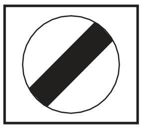
Date: ____________ Day:__________

7. Write down the order of rotational symmetry of each of these road signs.

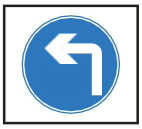
a



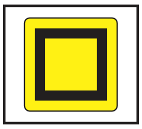
b



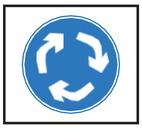
c



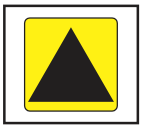
d



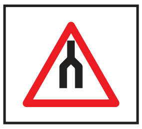
e



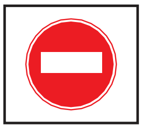
f



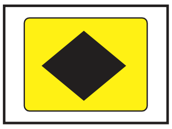
g



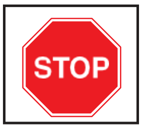
h



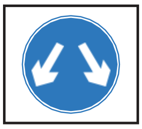
i



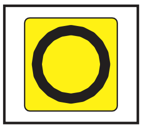
j



k

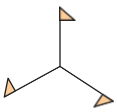


I

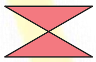


8. Write the letter of each of the shapes below in the correct space in the table. Shape **a** has been done for you.

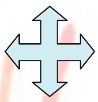
a



b

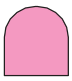


c

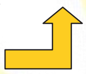


d

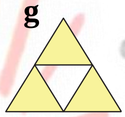
e



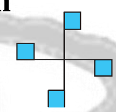
f



g



h



		Number of lines of symmetry				
		0	1	2	3	4
Order of rotational symmetry	1					
	2					
	3	a				
	4					

9. Samir has five red tiles and four white tiles.

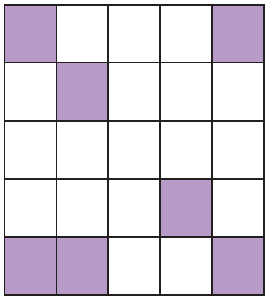
Draw two different ways that Samir could arrange these tiles so that he has a shape with an order of rotational symmetry of 4.

Date: ____________ Day:__________

Topic: Nets of 3-D shape

Adil is making a pattern by colouring squares.

This is what he has drawn so far. He has coloured seven squares.



Make two copies of the diagram.

a. In the first diagram, colour one more square so that the new pattern has rotational symmetry of order 2.

b. In the second diagram, colour five more squares so that the new pattern has rotational symmetry of order 4.

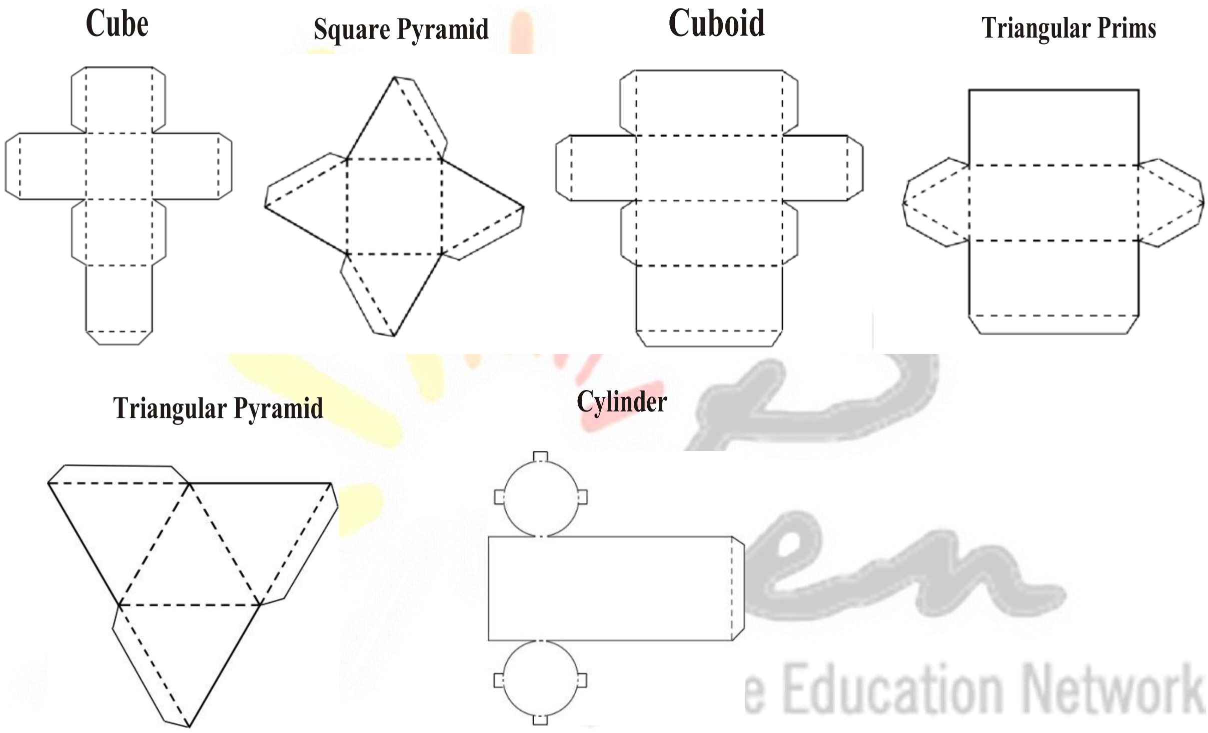
Date: ____________ Day:__________

In geometry, a 3-D shape is a solid shape which has width, height and depth.

A net is a two-dimensional plan or shape that can be folded to make a three dimensional solid. For some solids, such as the cube, there are many different nets. However, in the pages below, just one net has been provided for the cube, square pyramid, rectangular prism, triangular prism, triangular pyramid, cylinder and hexagonal prism.

Cutting out these nets, folding and gluing them to create a solid object, will help children become familiar with the features of these solids (such as their faces, edges and corners). Tabs have been included to help the children glue the solids together. (The tabs are not part of a net itself).

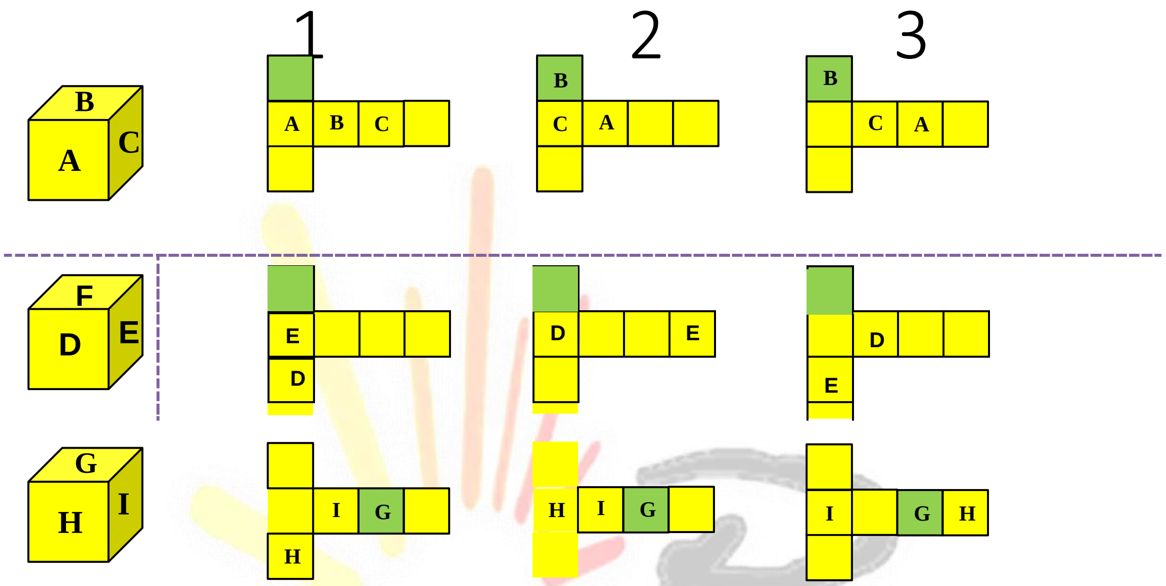
Another worthwhile activity is to cut open solids and unfold these to view a net. For example, an empty tissue box could be cut open and folded out to see the net of a rectangular prism.



Date: ____________ Day:__________

EXERCISE 7 H

1. Follow the instructions and fill the table. The green square comes from above.



a) For each cube (I, II and III), make every shape (1, 2 and 3) by interlocking the squares. Then fold each of the shapes to check which match the given cube.

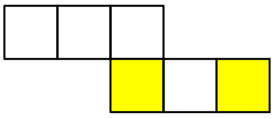
b) In the table below, enter **Yes** or **No** depending on whether the net belongs to the appropriate cube.

Cube / Net	I	II	III
1	No		
2			
3			

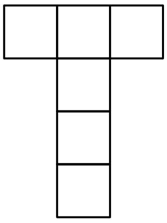
Date: ____________ Day:__________

2. Which sides are opposite after folding? Use the same color to paint them.

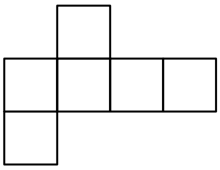
A



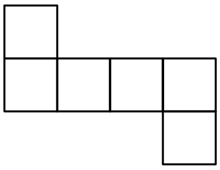
B



C



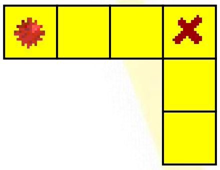
D



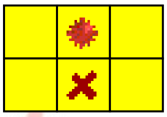
3. Follow the instructions and answer the questions.

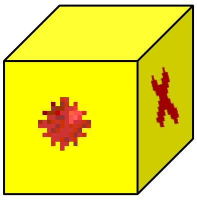
a) Which is the net of the cube shown?

A

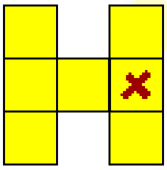


B

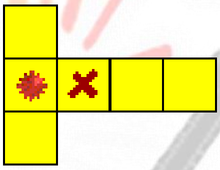




C



D

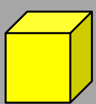
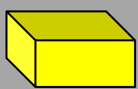
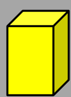
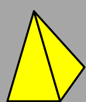
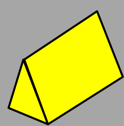


b) Copy each net to 1 cm square paper. Make the side of each face 3 cm long.

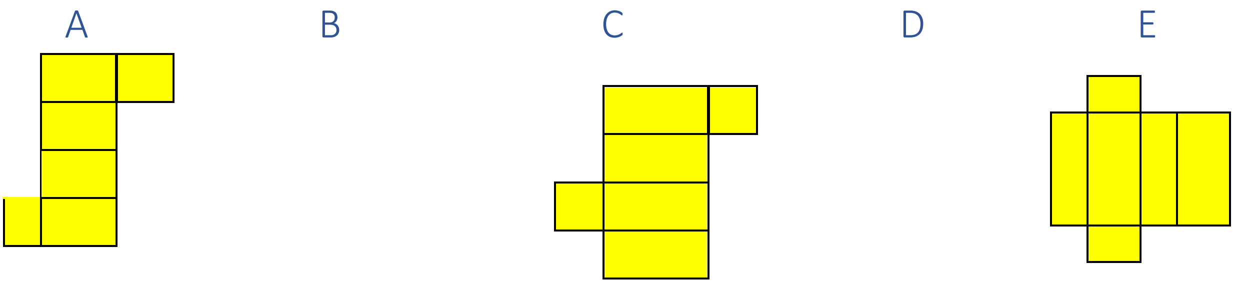
c) Cut out and fold each net to check your answer.

d) Remove one square to get an open cube without the face opposite to that containing a mark ,x

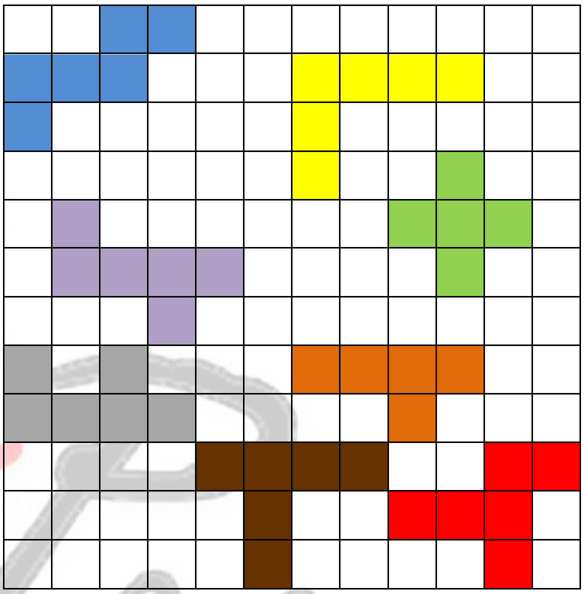
4. Complete the table.

	Cube 	Cuboid 	Rectangular prism 	Square-based pyramid 	Triangular prism 
Face shape	**6 squares**				
Net	**A**				

Date: ____________ Day:__________



5. Choose the color that represents a cube net.



a) Red
b) **Green**
c) Orange
d) **Grey**
e) Purple
f) **Yellow**
g) Brown
h) **Blue**

Date: ____________ Day:__________

REVIEW EXERCISE 7

1. Mariam and Sakina start from a point A. Mariam moves towards east up to E and Sakina moves towards south up to S. Draw their paths and name the kind of angle which will be formed between them.

2. State the kinds of angle that is formed between thefollowing directions:

(i) East and West (ii) East and North

(ii) From North to West through East

3. Take three non-collinear points A, B and C

Draw AB, BC and CA. What figure do you get? Name it.

4. Is it possible to have a triangle, in which:

(i) Two of the angles are right angels?

(ii) Two of the angles are acute?

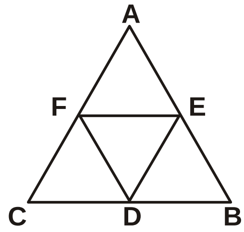
(iii) Two of the angles are obtuse?

(iv) Each angle is less than 60^{o}.

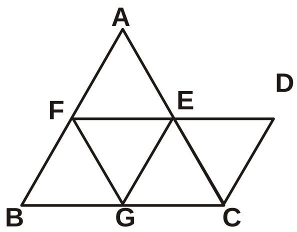
Date: ____________ Day:__________

5. How many quadrilaterals are formed in the adjoining figure?

Name them.



6. Write the names of the triangles and quadrilaterals formed in the figure. Also mention their kinds.



7. Two angles of a triangle are of measure 65^{o} and 45^{o}.Find the measure of the third angle.

8. Prove that a square is a rectangle but a rectangle is not a square.

Date: ____________ Day:__________

Unit # 8: Perimeter and Area

Learning Outcomes:

After Completing these activities, students will be able to:

- **Differentiate between perimeter and area of a square and rectangular region.**
- **Identify the units for measurement of perimeter and area.**
- **Find and apply formulas to find perimeter and area of square and rectangular region.**
- **Solve real life situations involving perimeter and area of square and rectangular regions.**

Topic: Open and Closed figure

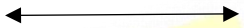
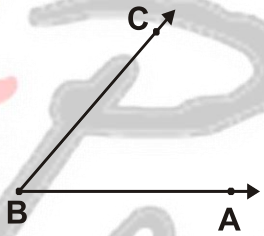
Let's learn:

Recognize region of a closed figure.

There are two types of figures in geometry.

(a) Open figures (b) Closed figures

(a) Open figures:

A line  **and an angle** 

are example of open figure.

Here are some more examples of open figures.

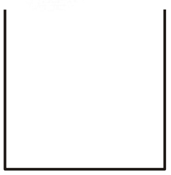


Fig. 1

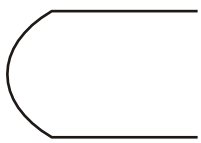


Fig. 2

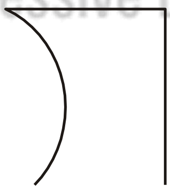


Fig. 3

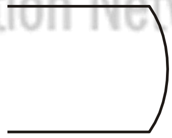


Fig. 4

We cannot determine the region enclosed by the open figures because it is open on at least one side.

(b) Closed figures

Consider another figure (i). It is closed figure represented by the triangle XYZ. It shows the triangular region which is marked by dots. $\overline{XY}, \overline{YZ}, and\ \overline{ZX}$ form the boundary of the triangular region XYZ. The sides $\overline{XY}, \overline{YZ}, and\ \overline{ZX}$ are the parts of triangular region.

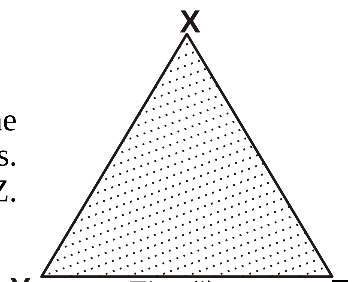


Fig. (i)

Date: ____________ Day:__________

We can also show the closed figure in the form of the circular region figure (ii). The boundary of this circular region is the circle itself.

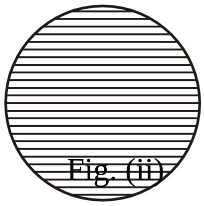
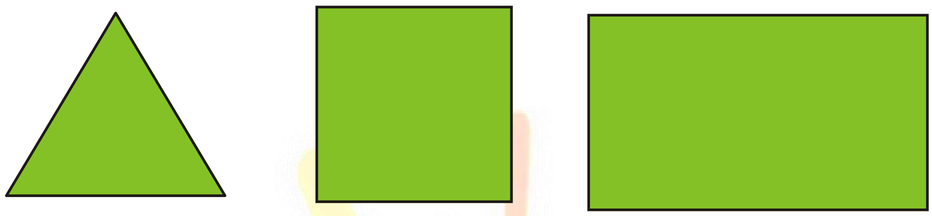


Fig. (ii)

Topic: Area and Perimeter

Differentiate between perimeter and area of a region.

Look at the following figures.



A triangular region A square region A rectangular region

Here we see that these regions are bounded of line segments only. This enables us to find the distance around the figure or the length of the boundary which is known as the **perimeter** of the figure.

"Perimeter" is the measure of the total length of the sides,or line segments of any figure. It is measure of length of thesides, or the boundary of the region. The unit of the perimeteris same as that of length.

The unit to measure the perimeter are m (metres) and cm (centimeters) etc.

"Area" is the measure of the region of a closed figure. Wecan find the area of a closed figure by fitting units squares.

The unit to measure the area are m^2(squared metres) and cm^2 (squared centimeters) etc.

Example: Find the perimeter and area of rectangle with sides of 5cm and 6cm

Solution:

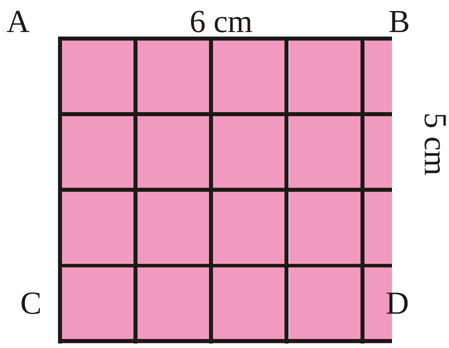
Length = 6 cm

Breadth= 5 cm

Perimeter = B + L + B + L

= 5 + 6 + 5 + 6

= 22 cm



In given rectangle there are total 30-unit squares. So, the area of ABCD = 30 squares cm.

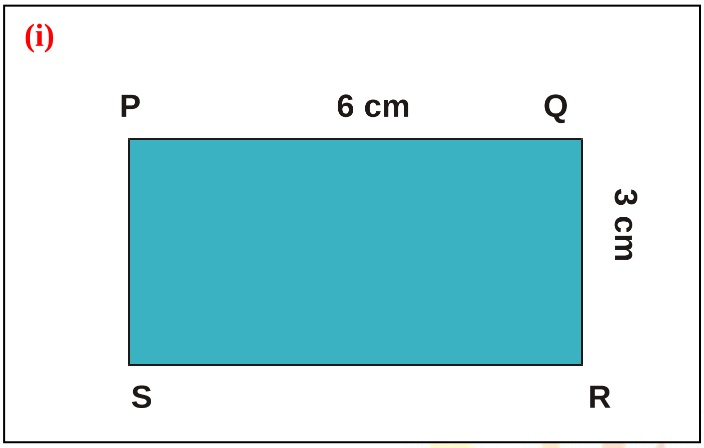
Identify units for measurement of perimeter and area.

(a) Units for the perimeter

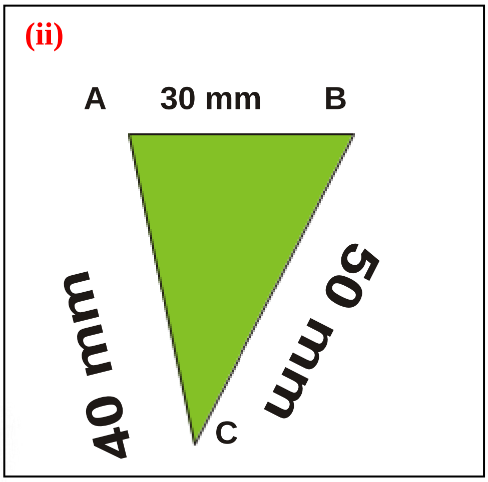
Look at the following figures:

Examples:

(i)



(ii)

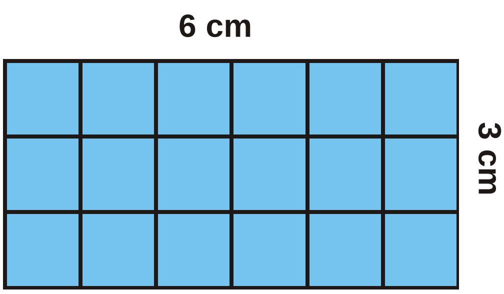


Here PQRS is a rectangle.		
m PQ	=	6 cm
m QR	=	3 cm
m SR	=	6 cm
m PS	=	+ 3cm
Perimeter		18 cm

Here ABC is a triangle. Remember 10 mm = 1 cm				
m AB	=	**30 mm**	=	3 cm
m BC	=	**50 mm**	=	5 cm
m AC	=	**40 mm**	=	+ 4 cm
Perimeter				12 cm

> The unit for the perimeter is the same as the length used,
>
> i.e we can use mm, cm, m and km as the units for measurement of the perimeter.

(b) Units of the area



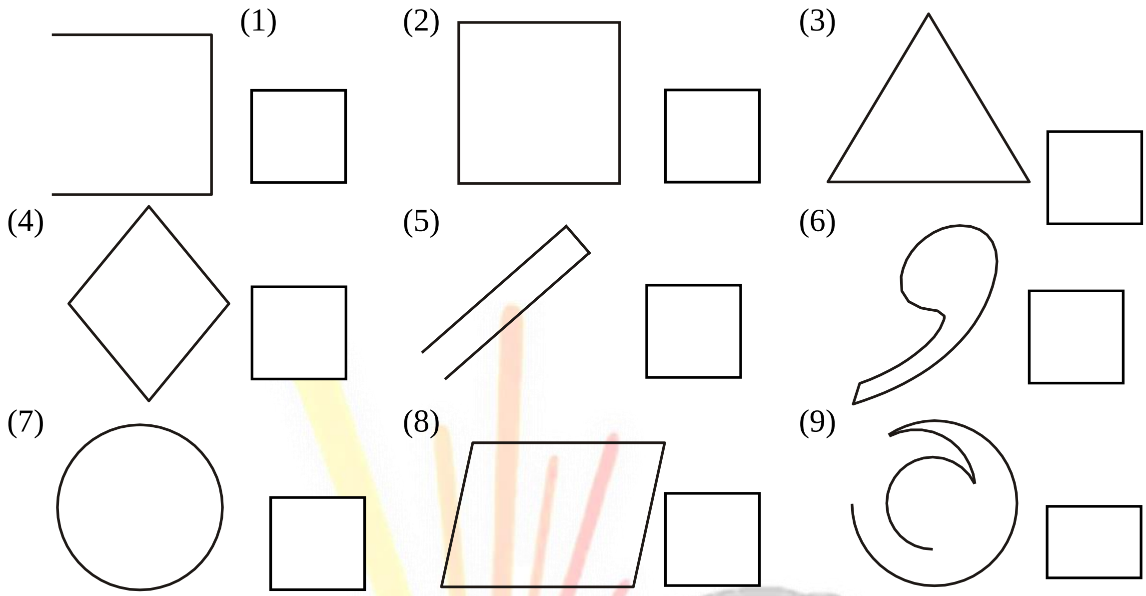
In the figure the length of rectangle is 6 cm and its breadth is 3 cm. We can find its area by fitting each unit squares with one side of 1 cm, there are total 18-unit squares in the rectangle.

So, its area is 18 squares with side of 1 cm each. i.e. Area = 18 sq. cm

Here the unit of area is sq. cm Similarly sq. m, sq. km, sq. mm are also the units of area.

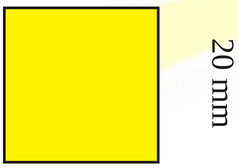
EXERCISE 8 A

A. Look at the following figures carefully. (✓) the shapes which are closed figures and (✗) the open figures.



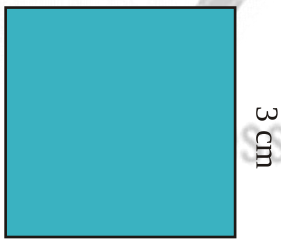
B. Find the perimeter and write the unit of perimeter for each of the following:

(1)



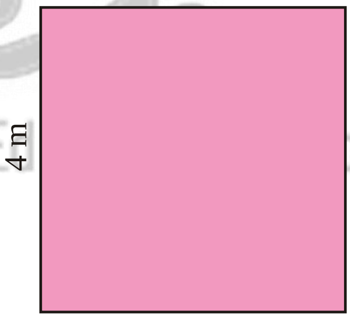
(a) Here perimeter____.
(b) Unit of perimeter__.

(2)



(a) Here perimeter____.
(b) Unit of perimeter__.

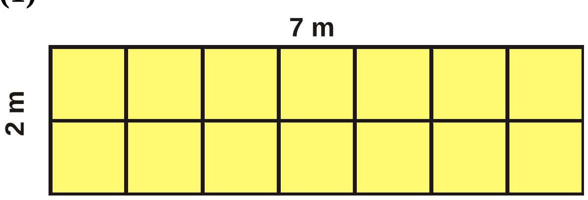
(3)



(a) Here perimeter____.
(b) Unit of perimeter__.

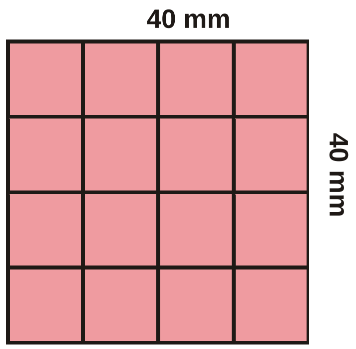
C. Find the area by counting small unit squares and write the unit of area for each of the following:

(1)



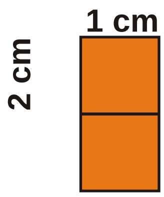
(a) Area________squares.
(b) Area Unit of area_______.

(2)



(a) Area_____squares.
(b) Area Unit of area_____.

(3)



a) Area___squares.
b) Area Unit of area______.

(4)

a) Area_____squares.
b) Area Unit of area_________.

Topic: Area and Perimeter of a Square and Rectangle

Write and apply the formulas for the perimeter and area of a square and rectangle

(a) Formulas for perimeter of a square and rectangle

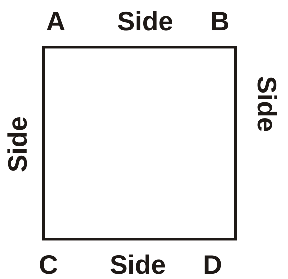
(i) We know that a square is a quadrilateral shape in which all its four sides are equal.

Perimeter of the squareABCD $= \text{m } \overline{AB} + m\overline{BC} + m\overline{CD} + m\overline{DA}$

$= \text{side} + \text{side} + \text{side} + \text{side}$

$= 4 \times side$

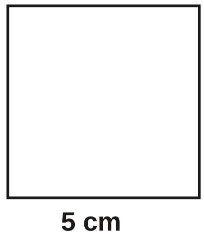
$= 4 \times (lenght\ of\ the\ side\ of\ a\ square\ )$



Thus, formula for perimeter of a square = $4 \times \ell$

Date: ____________ Day:__________

Example 1: Find the perimeter of a square whose each side is of length 5cm long?



Solution:

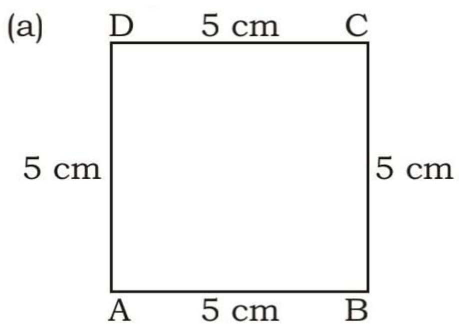
Here side = 5 cm

Perimeter = 4 $\times \ell$

= 4$\times$ 5

= 20 cm

Find the perimeter of each square.



Perimeter = 4 $\times \ell$

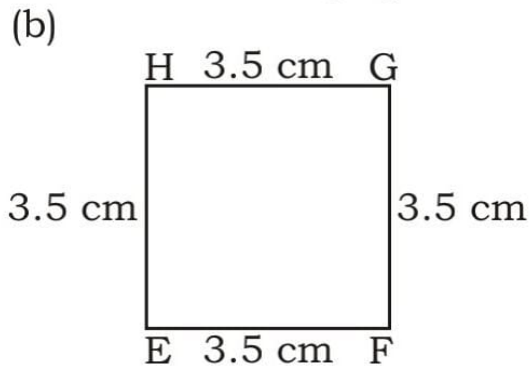
= 4$\times$ ▢

= ▢ cm

Perimeter = 4 $\times \ell$

= 4$\times$ ▢

= ▢ cm



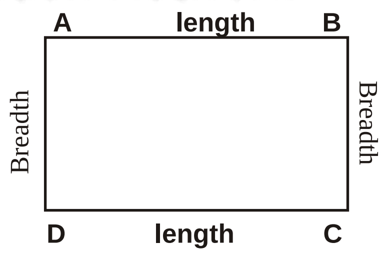
(ii) Draw a rectangle ABCD. Measure its sides.

Perimeter of the rectangle ABCD $= \mathrm{m}\,\overline{AB} + m\overline{BC} + m\overline{CD} + m\overline{DA}$

= breath + length + breath + length

$= 2\ \times lenght + 2\ \times breath$

$= 2 \times (lenght + breath\ )$



Thus, formula for perimeter of a square = 4 $\times$ (ℓ + b)

Example 1: Find the perimeter of a rectangle whose length and breadth are 12 cm and 8 cm respectively?

Solution:

Here, length = 12 cm

Breath = 8 cm

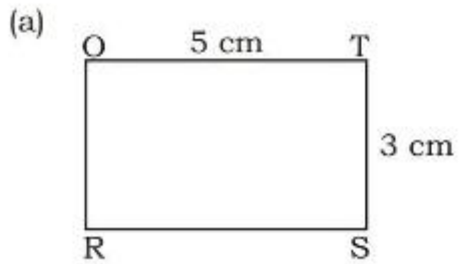
Date: ____________ Day:__________

Perimeter = 2 × (ℓ+ b) 12 cm

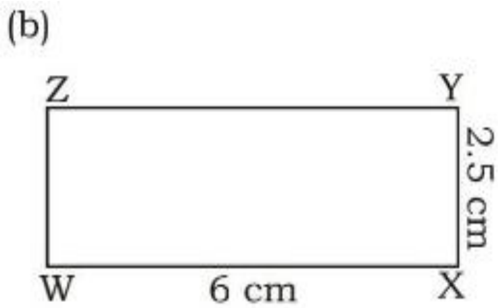
= 2 × (12 + 8)
= 2 × (20) cm

= 40 cm

Find the perimeter of each rectangle.



Perimeter = 2 × (ℓ +b)
= 2 × (▢ +▢)
= 2 × (▢) cm
= ▢ cm



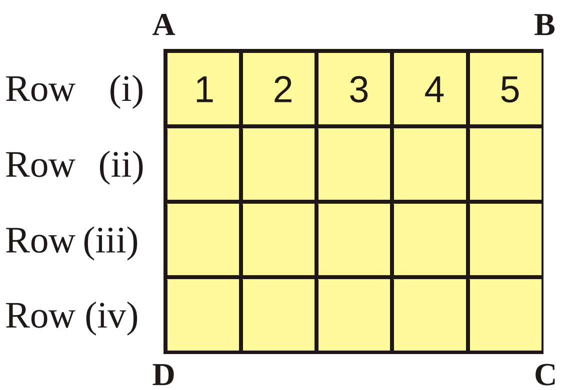
Perimeter = 2 × (ℓ +b)
= 2 × (▢ +▢)
= 2 × (▢) cm
= ▢ cm

(b) Formulas for area of a square and rectangle

Look at the rectangle ABCD with thelength of 5 cm and breadth 4 cm.

Length ____________

Breadth _



(i) What is the length of rectangle ABCD?

Date: ____________ Day:__________

(ii) What is the breadth of rectangle ABCD?

(iii) How many rows in the figure?

(iv) How many unit squares in one row?

(v) How many unit squares altogether?

Thus, the area of given rectangle ABCD = 20 cm^2.

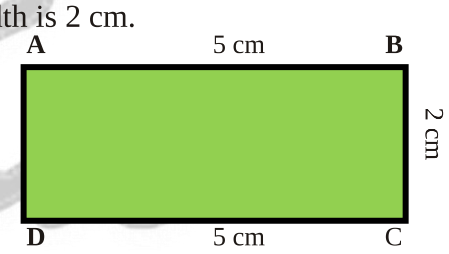
So, area of rectangle = Length × Breadth

Thus, the formula for finding the area of a rectangle is:

Area of a rectangle = Length × Breadth

Or = $\ell \times b$

Example. Find area of a rectangle whose length is 5 cm and breadth is 2 cm.



Solution: Here length = 5 cm

Breadth = 2 cm

Area of a rectangle ABCD

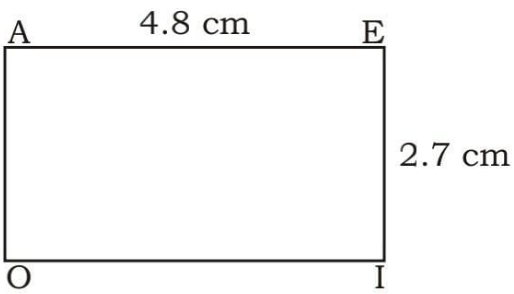
= Length x Breadth.

= 5 × 2 = 10 cm^2

= 20 cm

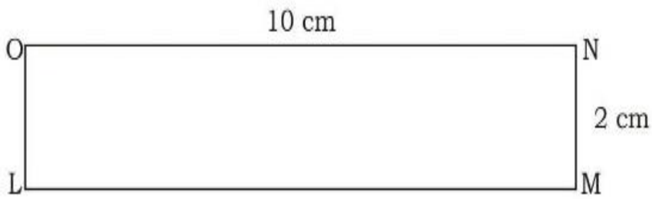
Date: ____________ Day:__________

Find the area of each rectangle.

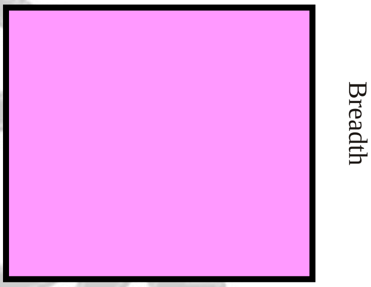


Area = $\ell \times b$
= ▢ × ▢
= ▢ cm^2

Area = $\ell \times b$
= ▢ × ▢
= ▢ cm^2



Using formula, find area of the given square shape.



The area of a square PQRS = Side × Side.

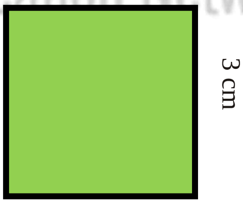
Area = $\ell \times \ell$

Example. Find area of a square who's each side is 3 cm.

Solution: Here Side = 3 cm

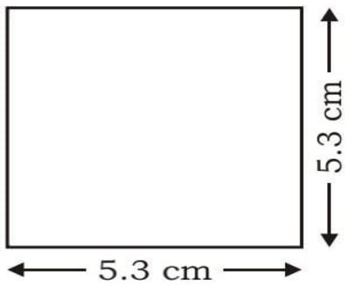
Area of a square = Side × Side

= 3 × 3 = 9 cm^2

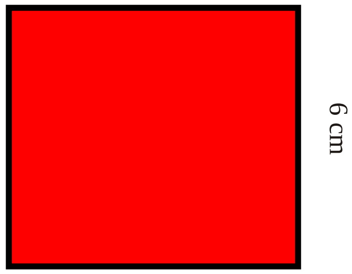


Date: ______________ Day:___________

Find the area of each square.



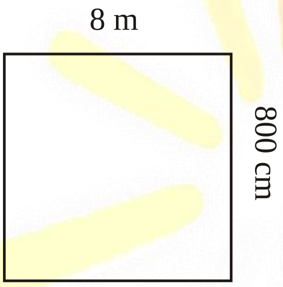
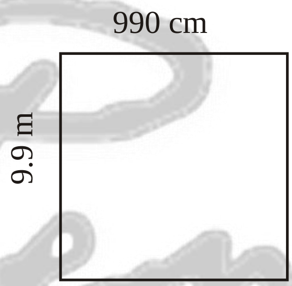
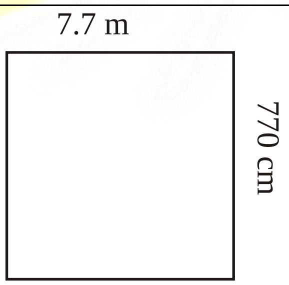
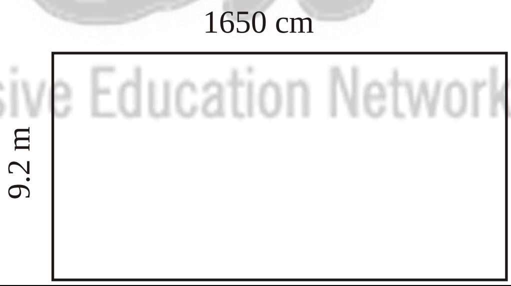
Area = ℓ × ℓ
= ▢ × ▢
= ▢ cm^2



Area = ℓ ×ℓ
= 4× ▢
= ▢ cm

EXERCISE 8 B

A. Find the area of the following shapes by using formula.

(1) 	(2) 
(3) 	(4) 

B. Find the area and perimeter of each of the followingrectangles.

(1) L = 3 cm, B = 2 cm (2) L = 5 cm, B = 1 cm

Date: ____________ Day:__________

(3) L = 4 cm, B = 3 cm

(4) L = 8 cm, B = 2 cm

(5) L = 9 cm, B = 5 cm

(6) L = 7 cm, B = 4 cm

(7) L = 4.5 cm, B = 2 cm

(8) L = 8 cm, B = 3.5 cm

C. Find area and perimeter of a square whose sides are given below:

(1) 4 cm

(2) 6 cm

(3) 7.5 cm

(4) 8.2 cm

(5) 5 cm 6 mm

(6) 9 cm 2 mm

Date: ____________ Day:__________

D. Answer the questions.

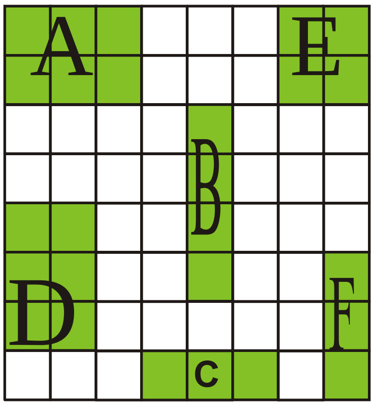
a) Which shape has the same areaas shape B?

b) Which shape has the same areaas shape C?

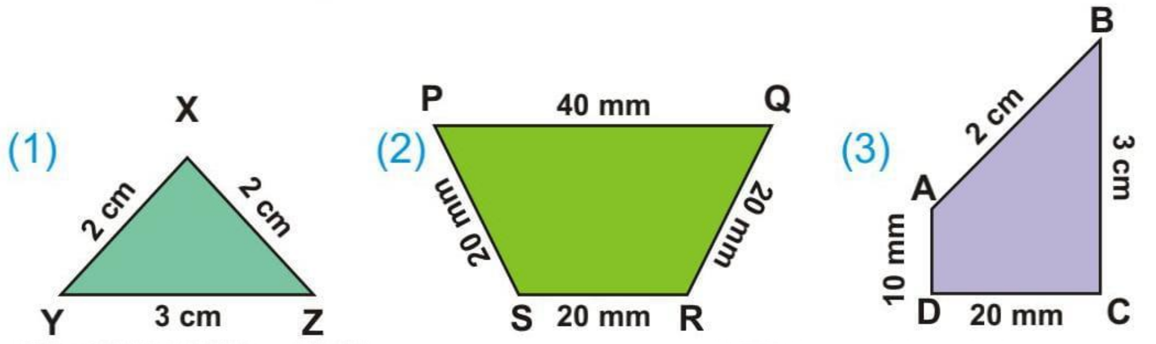
c) Which rectangle shapes are equalin area as rectangle A?

d) Which rectangle shapes are equalin area as square E?

e) Which shapes have the same area?



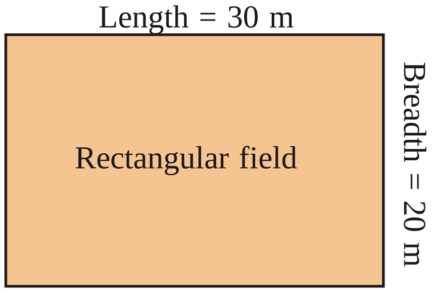
E. Find the perimeter of each of the following figures:



Date: ____________ Day:__________

Topic: Solve real-life problems of perimeter and area.

Example 1. Length of a rectangular field is 30 m and its breadth is 20 m. Find the perimeter of the rectangular field.



Solution:

Length of the given rectangular field = 30 m

Breadth of the given rectangular field = 20 m

Formula: Perimeter of the given rectangular field is 2 × (Length + Breadth)

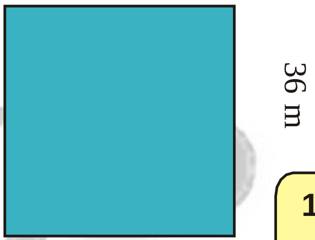
= 2 × (30 m + 20 m)

= 2 × 50 m

= 100 m

Example 2. A square ground has each side 36 m. What distance will a boy cover by cycling around the ground three times?

Solution: The side of the square ground is 36 m each. Therefore, perimeter of theground is:



4 × side= 4 36 m

= 144 m

144
x 3
432

In one time boy will cover 144 m distance

In three times the boy will cover 144 × 3 = 432 m

Example 3. The perimeter of a rectangular park is 320m.Its length is 70m. Find the breadth.

Solution:

Perimeter =320m

Length = 70m

Perimeter = 2 × (length + breadth)

Breadth = $\frac{\text{Perimeter}}{2} - \text{lenght}$

$= \left(\frac{320}{2}\right) - 70 = 160 - 70$

= 90 m

Example 4. The perimeter of a square shape is 280 cm. Findthe length of each side.

Solution:

Perimeter = 280 m

Length of each side = $\frac{\text{Perimeter}}{4}$

Length of each side = $\frac{280}{4} = \frac{70}{1} = 70\ cm$

Date: ____________ Day:__________

Example 5. A rectangular field is 80m long and 60m wide. Find the cost of laying green grass in it; at a rate of Rs. 2.50 per meter square.

Solution:

Rectangular field has length = 80m, width = 60m

Area of rectangular field = Length × Width

= 80m × 60m

= 4800 m^2

Now let us find the cost of laying green grass in the field.One square meter costs Rs. 2.50

4800 square meters will cost Rs. (4800 x 2.50)

= Rs. 12000

EXERCISE 8 C

1. A rectangular park is 84 m long and 56 m broad. Find the perimeter of the park.

2. A square room is 7 m wide. Find the area of the room.

3. A square picture is 60 cm wide. How long wooden framewill be required to reap it from all sides?

4. The length and breadth of a rectangular agriculture field are 190 m and 160 m respectively. Find the area and the perimeter of the field.

Date: ____________ Day:__________

5. How much lace is required to fix around a rectangular bed sheet, whose length is 2 m 80 cm and width is 1 m 50 cm?

6. Find the area of both fields; a square of 25 m side and arectangle 30 m in length and 20 m in breadth.

7. A rectangular agriculture park is 75 m long and 40 m wide. Find the cost of laying green grass in it at the rate of Rs 25 per square metre.

8. Consider a room 15m long and 12m wide. A squarecarpet 10m x 10m is placed on it.

(i) What is the area of the floor of the room?

(ii) What is the area of the carpet?

(iii) Which is the more in area; the floor or the carpet?And by how much?

Date: ____________ Day:__________

REVIEW EXERCISE 8

A. Choose and tick (✓) the correct answer.

1. The space occupied by the boundary of a shape is called:

(a) triangle (b) square (c) perimeter (d) region

2. The distance along all the sides of a closed shape is called:

(a) triangle (b) square (c) perimeter (d) region

3. The perimeter of a square of length of each side 4 cm is:

(a) 16 m (b) 16 m^2 (c) 16 cm (d) 16 cm^2

4. The area of a square having each side of 3 cm is:

(a) 6 cm (b) 9 cm (c) 9 cm^2 (d) 12 cm

5. The area of a rectangle with length 4 cm and breadth 2 cm is:

(a) 4 cm (b) 8cm (c) 8 cm^2 (d) 12 cm

6. The perimeter of a rectangle with length 6 cm andbreadth 3 cm is:

(a) 6cm (b) 18 cm (c) 9 cm (d) 15 cm

B. Answer the following questions.

1. Write formula of area of a square.

2. Write formula of perimeter of a rectangle.

3. Find the perimeter and area of a square of side 7 cm.

4. Find the perimeter and area of a rectangle with length and breadth 8 cm and 5 cm respectively.

Date: ____________   Day:__________

Unit # 9: Data Handling

Learning Outcomes:

After Completing these activities, students will be able to:

- **Find and describe average of given quantities in the data.**
- **Solve real life situations involving average.**
- **Organize the given data using bar graph.**
- **Read and interpret a bar graph given in horizontal and vertical form.**
- **Draw horizontal and vertical bar graphs for given data.**
- **Solve real life situation using data presented in graphs**

Topic: Average

Example 1. Once Shahid Afridi made 6 runs in the first over,10 runs in the second over, 8 runs in the third over and 4 runsin the fourth over.

Now answer the following questions:

1. What was the number of his total runs?

6 + 10 + 8 + 4 = **28 runs**

2. How many overs did he play?

4 overs

3. What was his run rate (runs per over)?

To answer this question, we find average as under:

$$\text{Run rate} = \frac{\text{Total runs made in all the overs}}{\text{Total numbers of overs played}}$$

$$= \frac{28}{4} = 7 \text{ runs per over}$$

The run rate 7 is the average score. This 7 represents his performance in all overs.

Or

Average is the overall representative of the information.

Average = Sum of the quantities divided by the total number of quantities

Date: ____________ Day:__________

Example 2. Find the average of 5, 8, 10, 12 and 20.

Solution:

Sum of given numbers = 5 + 8 + 10 + 12 + 20 = 55

$$\text{Average} = \frac{\text{sum of quanties}}{\text{total number of quantities}}$$

$$\text{Average} = \frac{55}{5} = \frac{11}{1} = 11$$

Thus the average of the given numbers is **11**.

Example 3: Find the average of given numbers.

4.5, 5.5, 7.5, 6.5, 6.5, 9.5, 7.6

Solution : $\text{Average} = \frac{\text{sum of given quantiies}}{\text{Numbers of given quantities}}$

$$= \frac{4.5+5.5+7.5+6.5+6.5+9.5+7.6}{7} = \frac{47.6}{7} = 6.8$$

Activity 9(a) Find the average of first five even numbers.

Solution: First five even numbers are: 2, 4, 6, 8 and 10.

$$\text{Average} = \frac{\text{sum of quanties}}{\text{total number of quantities}}$$

Solve it,

$$= \frac{2+4+6+8+10}{5} = \boxed{\frac{\quad}{\quad}} = \boxed{\quad}$$

Activity 9(b) Find the average of first five odd numbers.

Solution: First five even numbers are: ☐, ☐, ☐, ☐ and ☐.

$$\text{Average} = \frac{\text{sum of quanties}}{\text{total number of quantities}}$$

= ______________ = _____ =

Date: ____________ Day:__________

EXERCISE 9 A

1. Find the average (mean) of the following numbers.

(1) 12, 14, 18 and 20

(2) 1, 2, 3, 4, 5, 6 and 7

(3) 6, 7, 8, 9, 7, 6, 5 and 15

(4) 2, 3, 5, 7, 11, 13, 17 and 19

(5) $\frac{1}{2}, \frac{2}{5}, \frac{3}{4}$ and $\frac{4}{5}$

(6) $\frac{3}{10}, \frac{7}{20}, \frac{11}{30}, \frac{13}{40}$ and $\frac{17}{50}$

(7) 1.1, 2.2, 3.3, 4.4, 5.5 and 6.6

(8) 13.5, 7.5, 6.5, 9.5, 5.5, and 7.5

Date: ____________ Day:__________

Topic: Solve real life problems involving average

Example 1. The attendance of class V during six days of a week was: 44, 40, 37, 42, 35 and 36. Find the average attendance.

Solution: Daily attendance = 44, 40, 37, 42, 35, 36.

$$\text{Average} = \frac{\text{Total attendance}}{\text{number of days}}$$

$$\text{Average attendance} = \frac{44+40+37+42+35+36}{6} = \frac{234}{6}$$

$$\text{Average attendance} = \frac{39}{1} = 39$$

Thus, average attendance is 39.

Example 2. The business train covers a distance of 450 km in6 hours. What is its average speed?

Solution:

$$\text{Average speed} = \frac{\text{Distance covered}}{\text{Number of hours}}$$

$$= \frac{450km^{75}}{6h^{1}} = \frac{75}{1} = 75\ km\ per\ hr$$

Thus average speed of the train will be 75 km/hr .

EXERCISE 9 B

1. Rabia obtained 65 marks in Maths, 72 marks in Urdu,60 marks in Science, 75 marks in Sindhi and 70 marks in Islamiyat. Find her average marks.

Date: ____________ Day:__________

2. Kalsoom saved rupees 13, 15, 12, 20, 25, 30 and 18 during a week. What is her average saving per day?

3. The maximum temperature of Sanghar city recordedduring the week of June last year was $36.3^{o}C$, $42.7^{o}C$, $41.6^{o}C$, $38.5^{o}C$, $40.4^{o}C$, $41.9^{o}C$ and $42.8^{o}C$. Find the average temperature during that week.

4. A Qari wants to recite the Holy Qura'n in 15 days during the holy month of Ramzan. What will be the average number of Paras he has to recite daily?

5. Saleem scored 50, 70, 100, 60 runs in the four one day matches. What was his average score?

6. A labour earns Rs 577 on the first day, Rs 600 on the second day and Rs 725 on the third day. Find his average income per day.

Date: ____________ Day:__________

7. A train covers a distance of 560 km in 8 hours from Karachi to Rohri. What is its average speed?

8. A car covers a distance of 55 km in the first hour, 60 km in the second hour, 45 km in the third hour and 30 km in the fourth hour. Find the average speed of the car per hour.

9. Akmal get 8 wickets for 72 runs. Find average runs he has given for wicket.

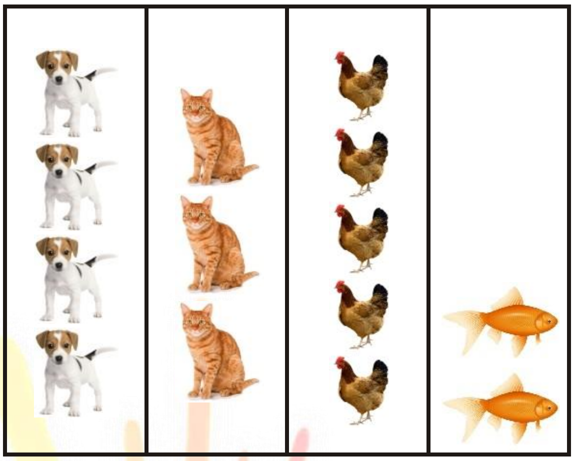
10. The total rainfall recorded in 6 different cities was 48 mm in Sindh Province during last year. Find the average rainfall for each city.

Date: ____________ Day:__________

Topic: Organize the data using Bar graph

Draw vertical bar graphs or horizontal bar graphs

Example 1. The number of animals in Ali's farm house has been represented in picture graph.

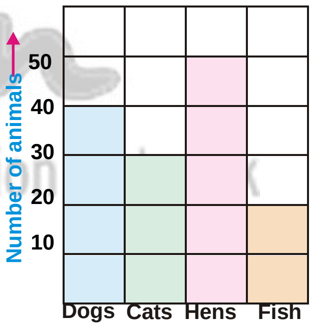


Dogs **Cats** **Hens** **Fish**

Each  represent 10 dogs. Each  represent 10 cats.

Each  represent 10 hens. Each  represent 10 fish.

This diagram is called **picture graph**. Picture graph helps us to see quantity of each thing/item at a glance and help usto compare their differences. We can showthese number of animals in blocks as:



We call this a **bar graph.** Bar graph is used to represent objects and quantities.

Step of making a bar graph:

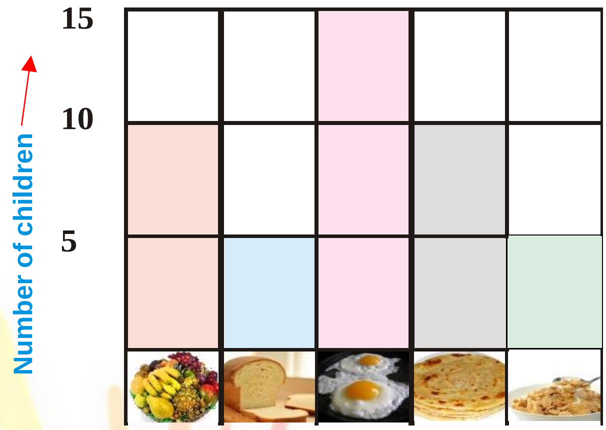
1. Make a horizontal line as X-axis and a vertical line as Y-axis.
2. Write the name of the animals on the X-axis and the number of animals on the Y-axis (make appropriate spaced marks of equal space to present you data).
3. One square with Y-axis represents 10 animals.
4. There are 40 dogs in the farm. So, we will colour 4 squares along the Y-axis.
5. Similarly, there are 30 cats we will colour 3 square along Y-axis and so on

Date: ____________ Day:__________

Example 2. Following table shows the result of the favourite breakfast food taken by class V students. Draw a block graph.

Fresh Fruit	Toast/ Bread	Eggs	Paratha	Cereal
10	5	15	10	5

Solution:



Read the above graph and answer the following questions:

(i) Which breakfast food is most favourite? ☐

(ii) Which breakfast food is equally favourite? ☐

(iii) Which breakfast food is least favourite? ☐

Activity 9(c)

The ages of a family members are as under. Help Sameer to draw the block graph.

Majeed is 30 years old.

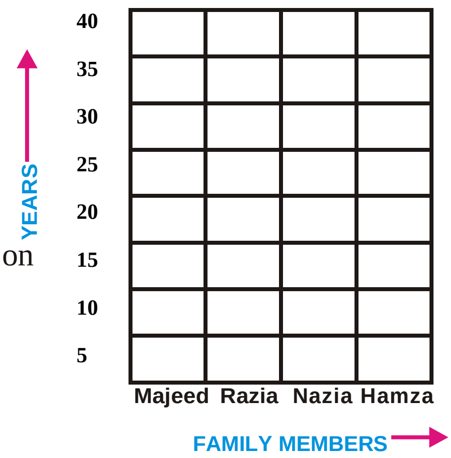
Razia is 25 years old.

Nazia is 10 years old.

Hamza is 5 years old.

Step 1: Select the ages on vertical side and family members on horizontalside of the graph.

Step 2: Colour the columns to show the information.

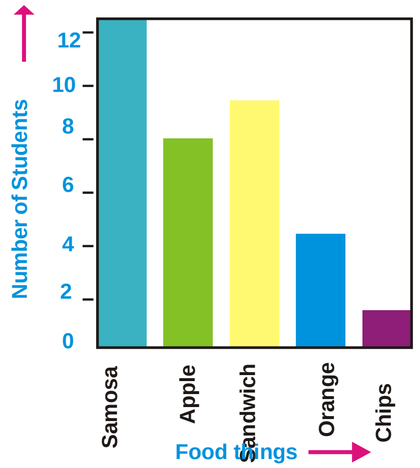


Read and interpret a simple bar graph given in horizontaland vertical form.

Activity 9(d)

Read the vertical bar graph and write the correct answer in the box.

This bar graph represents information about students as to what they ate at playtime in school. The different food things are shown on horizontal line and number of students are shown on vertical line.

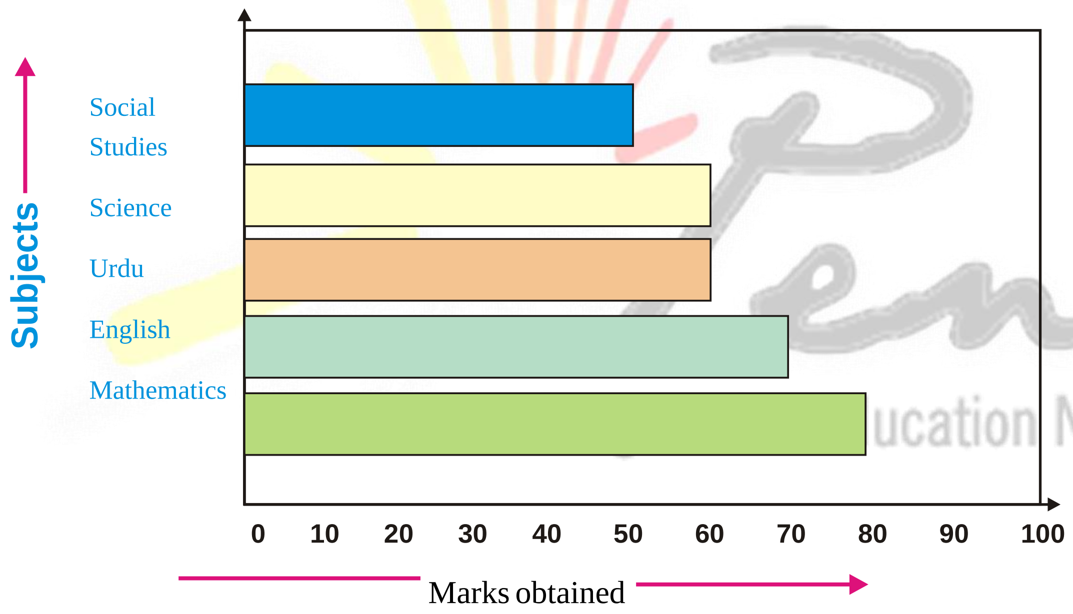


Answer the following questions

(1) How many children ate samosa? [12]
(2) How many children ate oranges? [ ]
(3) How many children ate apples? [ ]
(4) How many children ate sandwiches? [ ]
(5) How many children ate chips? [ ]

Activity 9(e)

Read the following horizontal bar graph. In this graph, the marks obtained by Yasir of Grade V in five subjects are given.



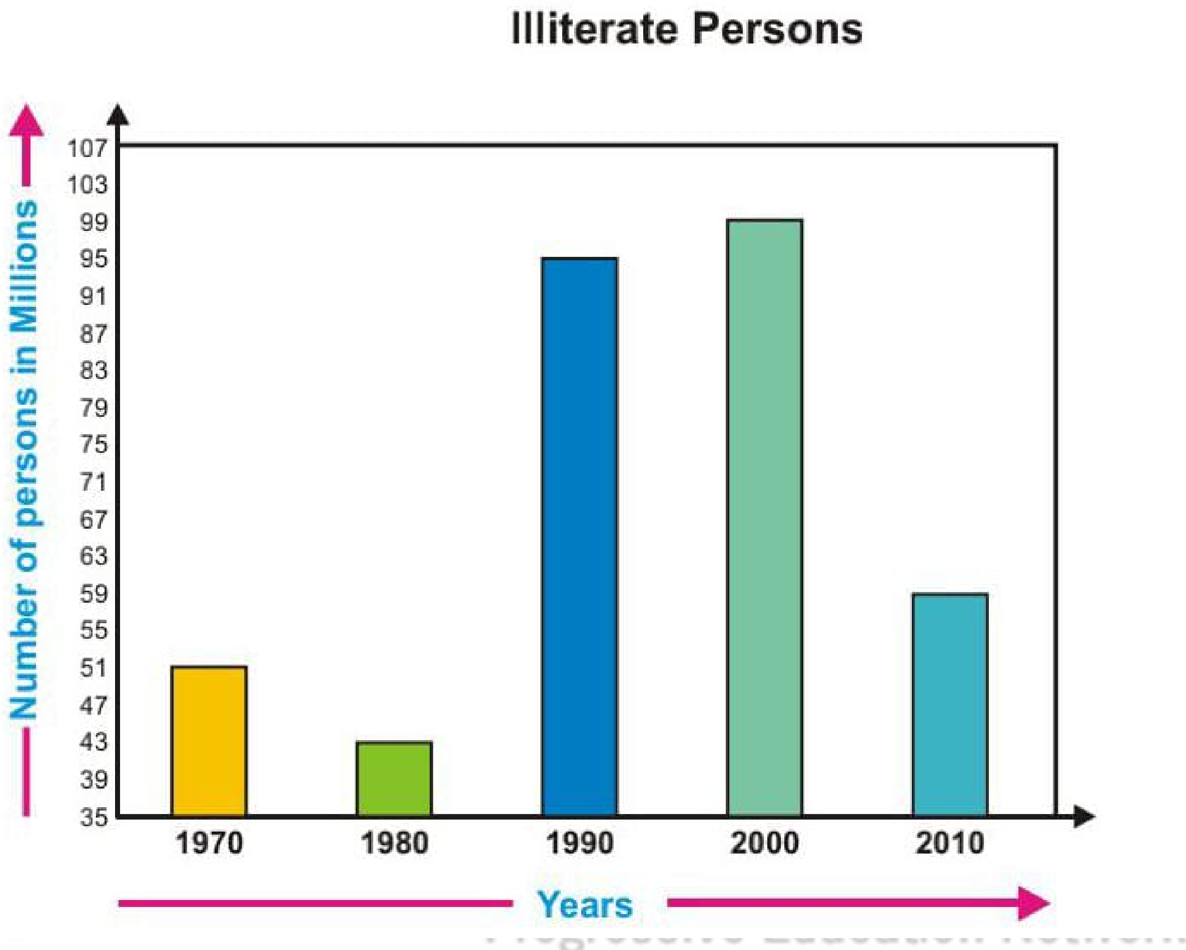
Read the horizontal bar graph and answer the followingquestions

(i) How many marks did Yasir get in English? How many marks did he get in Urdu? [70]
(ii) How many marks did he get in Mathematics? How many marks did he get in Science? [ ]
(iii) How many marks did he get in Social studies? [ ]
(iv) In which subjects did he get the least number of marks? How many total marks did he get? [ ]
(v) In which subject did he get the highest marks? [ ]
(vi) Which subjects he get equal marks? [ ]

Date: ____________ Day:__________

The following bar graph shows the number of illiterate persons in a country in different years.

Time in years is shown on the horizontal axis. The number in millions is shown on vertical axis.



Read the vertical bar graph and answer the following questions:

I. How many illiterate persons were there in 1990? 95 millions

II. In which year was number of illiterate persons highest?

III. What was the number of illiterate persons in 1980?

IV. How many illiterate persons were in 2010?

V. In which year was the number of illiterate persons the least?

Date: ____________ Day:__________

VI. How many illiterate persons were in 2005?

VII. How many illiterate persons were in 1995?

VIII. How many illiterate persons were in 1985?

IX. In which year the number of illiterate persons was 50 millions?

EXERCISE 9 C

1. Draw a bar graph of the following:

(i) Attendance of Faraz's class during a week.

Days	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Children	32	35	30	30	25	20

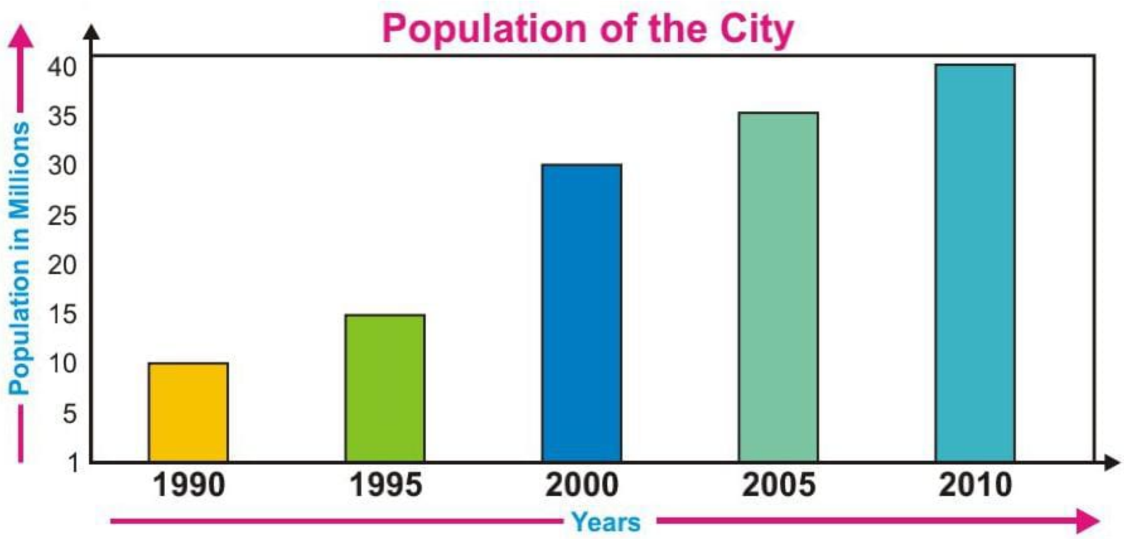
(ii) Result of examination of class V.

Grade	A1	A	B	C	D
No. of Children	20	25	15	20	5

(iii) The marks obtained by Amjad during annual examination.
Draw vertical and horizontal bar graph.

Subject	Islamiyat	English	Urdu	Maths	S.Studies	Science
Marks Obtained	80	50	65	90	40	55

2. The population of Dadu city is represented in thefollowing bar graph. Years are shown on horizontal axis. Population in millions is shown on vertical axis.

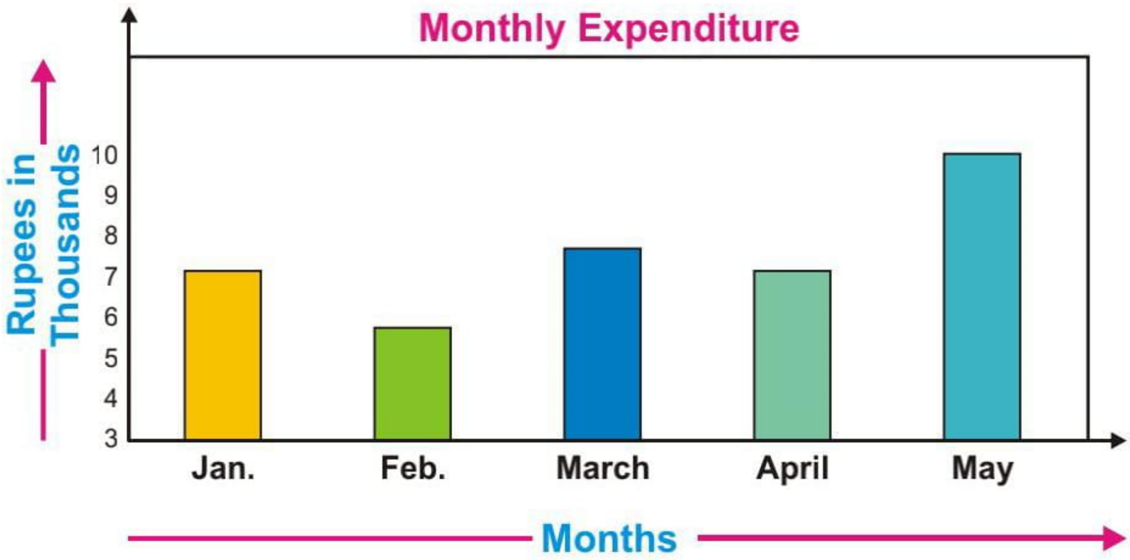


Read the graph and answer the following questions:

(i) What was the population of the city in 1995?
(ii) What was the population of the city in 2000?
(iii) What was the population of the city in 2005?
(iv) In which year the population was least?
(v) In which year the population was highest?
(vi) Read and prepare the chart from the graph.

Date: ____________ Day:__________

3. The expenditure of a family for five months is reported in the following bar graph. Names of months are shown on horizontal axis. Amount in thousand rupees is shown on vertical axis.



Look at the graph and answer the following questions:

(i) In which month expenditure was the least?

(ii) In which month the expenditure was the greatest?

(iii) What was the expenditure in the month of February?

(iv) What was the expenditure in the month of April?

(v) In which months the expenditure is equal?

(vi) In which month the expenditure isRs 8000?

(vii) What is the amount of highest expenditure?

(viii) What is the amount of lowest expenditure?

Date: ____________ Day:__________

REVIEW EXERCISE 9

1. Find the average of following numbers:

(i) 4, 3, 5, 8, 5, 10.

(ii) 10, 20, 30, 40, 50

2. The six-hour journey of a person on car is given below.

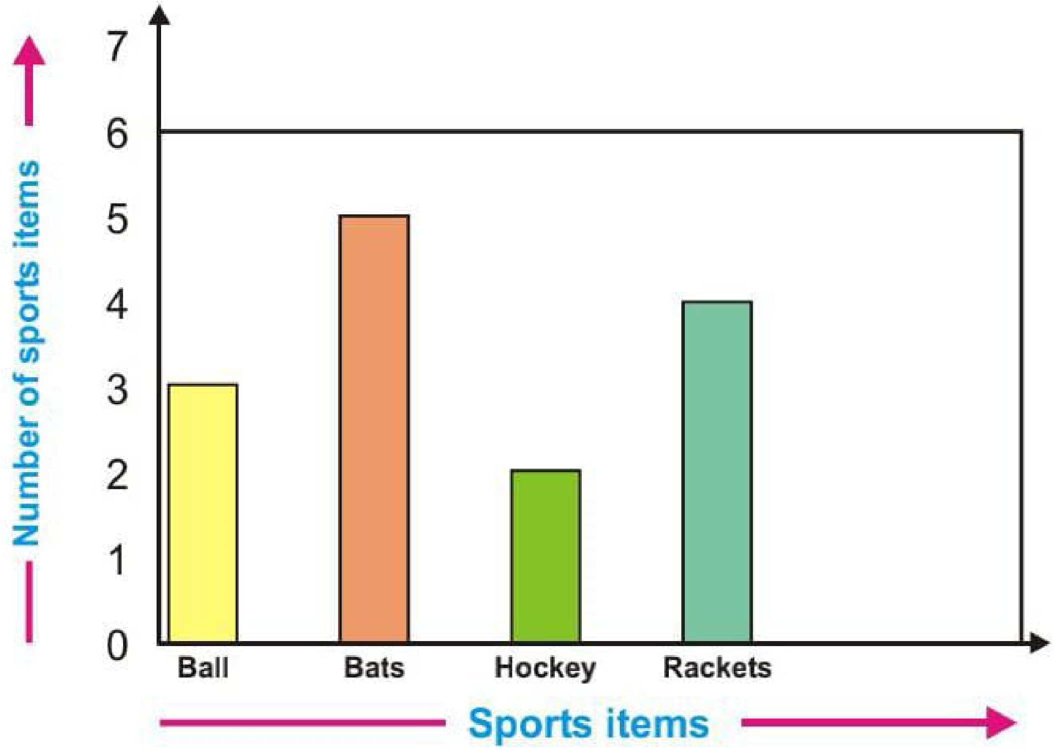
Hours	1	2	3	4	5	6
Distance in kilometres	20	18	20	22	16	18

What is the average distance covered per hour?

3. A batsman made 160 runs in two innings. Find theaverage runs he made in each innings.

Date: ____________ Day:__________

4. Read the graph and answer the following questions.

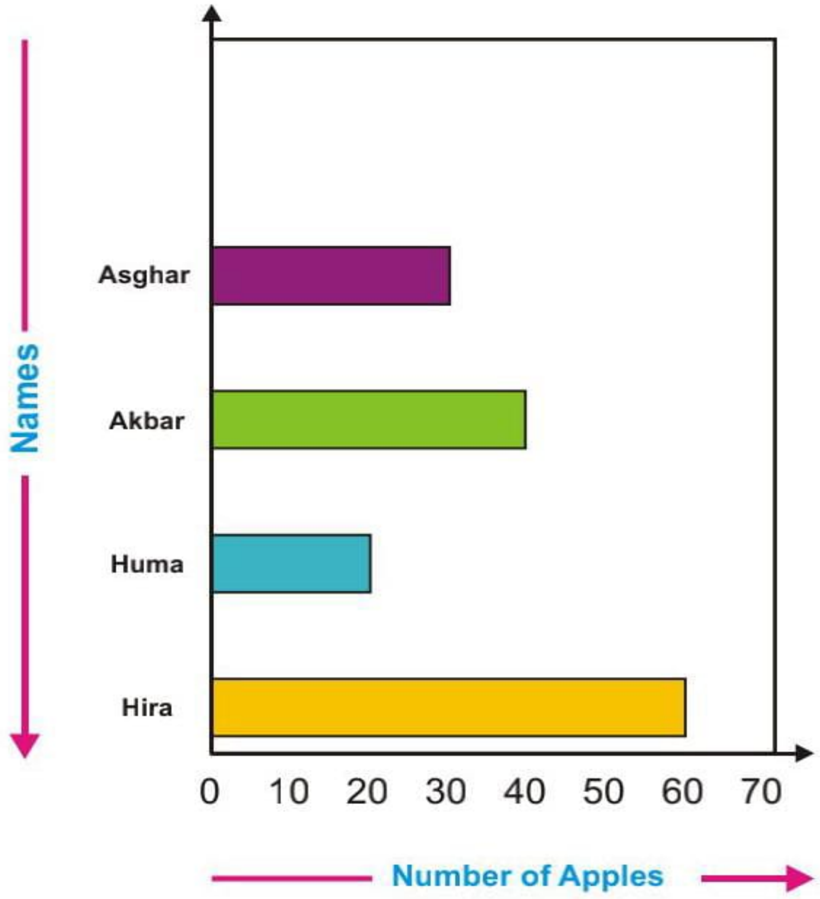


(i) How many balls are there? [ ]
(ii) How many bats are there? [ ]
(iii) How many hockey are there? [ ]
(iv) How many rackets are there? [ ]
(v) How many balls and bats are there? [ ]

(vi) How many bats and rackets are there? [ ]

Date: ____________ Day:__________

5. Interpret following vertical bar graph.



(i) How many apples does Asghar have?
(ii) How many apples does Akbar have?
(iii) How many apples does Huma have?
(iv) How many apples does Hira have?
(v) How many apples do Asghar and Akbar have?
(vi) How many apples do Huma and Hira have?

6. Fill in the blanks.

(i) The average of 5, 15, 30, 10 and 20 is ______________________
(ii) The average of 20, 40, 30 and 35 is ________________________
(iii) When we choose a suitable symbol to represent each part of information, we will use_____________________________graph.

Date: ____________ Day:__________

GLOSSARY

Acute angle: An angle which is less than 90^{o}.

Acute angled triangle: A triangle which has one of its angle acute angle.

Adjacent angles: Two angles with a common vertex and a common arm are called adjacent angles.

Angle: The amount of turning between two arms about a common point

Arc: A part of a circle.

Area: The space occupied within the boundary of a shape is called an area.

Associative property addition: The property that when any three numbers (fractions)are added in any order, their sum is always the same

Associative property multiplication: The property when any three numbers (fractions) are added in any order, their sum is always the same.

Average: The quantity that represents the given quantities.

Bar graph: It represents each part of the information in the form of bars(vertical or horizontal).

Capacity: The amount of liquid a container can hold.

Centimetre: A unit of length, 100 centimetres (cm) = 1 metre (m)

Circle: A plane shape bounded by a single curved line where all of its points are at equal distance from a fixed point.

Commutative property of Multiplication: The property that any two numbers when multiplied to each other in any order, their product is always same.

Commutative property of addition: The property that when any two numbers (fractions)are added in any order their sum is always same.

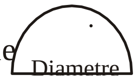
Complementary angles: Two angles whose sum of the measures is equal to 90^{o}.

Data: Information presented in the form of numbers.

Decimal: Any number containing a fractional part indicated by a decimal point is called decimal number or decimal.

Decimal fraction: A common fraction with a denominator as 10,100,1000 written with a decimal point.

Denominator: Lower number of the common fraction.

Diameter: Half circle's line segment is called diameter of the circle 

Direct proportion: The relationship between two ratios in which an increase in one quantity causes a proportional increase in the other quantity and a decrease in one quantity causes a proportional decrease in the other quantity.

Dividend: A number is to be divided by another number, till we get less number than the divisor.

Divisibility: A division in which when a number is divided by another, the remainder is zero.

Divisor: A number which can divide the other number exactly.

Edge: A one dimensional line segment joining two vertices.

Equivalent fraction: The fractions that have the same value.

Equilateral triangle: A triangle in which all the three sides are equal in length.

Factors: The divisor of a number.

Factorization: A number represented as a product of its factors.

Fraction: Part of a whole.

Gram: Unit of mass.

Graph: A pictorial representation of a data.

Hours: 24^{th} part of the day, 60 minutes. A unit of time

1 hour = 60 minutes

Inverse proportion: The relationship between the two ratios in which increase in one quantity causes a proportional decrease in the other quantity and a decrease in one quantity causes a proportional increase in the other quantity.

Isosceles triangle: A triangle with its two sides equal in length.

Kilogram: A unit of mass.1 kilogram (kg) = 1000 grams (g)

L.C.M: Least Common Multiple.

Like decimals: The decimals having same number of decimal places.

Like fractions: Fraction having same denominator.

Line: A B This figure represents a line AB.

Line segment: Shortest distance between two points. A B

Litre: Unit of volume/capacity 1 litre (*l*) = 1000 millilitres (*ml*)

Lunar Calendar: (Hijrah Qamri Calendar) Islamic Calendar in a solar year.

Mass: Quantity of matter present in a body.

Millilitre: Thousandth part of a litre.

Millimetre: Thousandths part of a metre.

Million: The smallest seven-digit number i.e. 1,000,000 (Ten hundred thousand).

Minute: Sixtieth part of an hour.

1 minute = 60 seconds

Mixed fraction: A fraction contains both a whole number and aproper common fraction.

Month: A unit of time. **1 month = 30 days**

Numerator: Upper number of common fractions.

Obtuse angle: An angle which is more than 90^{o}.

Obtuse angled triangle: A triangle which has one of its angles obtuse angle.

Percentage: The word percent is a short form of the Latin word "Percentum". Percent means out of hundred or per hundred.

Perimeter: The distance along the sides of a closed shape.

Prime factorization: A factorization in which every factor is a prime factor.

Proper fraction: A fraction whose numerator is less than the denominator.

Quadrilateral: A four-sided closed figure.

Quotient: The number shows how many times the divisor has been repeatedly subtracted.

Radius: The distance from the centre of the circle to the boundary of the circle.

Ray: An arrow mark on one end point of a line segment

A **Ray AB** **B**

Rectangle: A quadrilateral whose opposite sides are equal and have four right angles.

Reflex angle: An angle of measure greater than 180^{o}

Remainder: The number left over when one integer is divided by another.

Right angle: An angle whose measure is 90^{o}.

Right angled triangle: A triangle which has one of its angle of the measure 90^{o}

Round off decimals: To round off a decimal nearest to the whole number, check the first decimal place and accordingly round off the number.

Scalene triangle: A triangle whose all sides are of different measures.

Second: Unit of time, $\frac{1}{60}$the part of a minute.

Solar Calendar: In this calendar, the dates indicate the position around the sun(365 days in a year).

Square: A quadrilateral whose all four sides are equal and has four right angles.

Straight angle: An angle whose measure equals to 180^{o}.

Subtraction: Symbol (-) The process of finding difference between two numbers/quantities

Supplementary angles: Two angles whose sum of the measures is equal to 180^{o}.

Symbol: A sign used to represent an operation, element or relation.

Temperature: It is a measure how much cold or hot a body or a substance is.

Triangle: A three-sided closed figure.

Unit fraction: Numerator is equal to the denominator.

Unitary method: The process of finding the price of one (unit) item, from which we find the price of a number of similar items.

Unlike decimals: The decimals having different number of decimal places.

Unlike fractions: Fractions whose denominators are not same.

Vertex: An angular point of any shape.

Create Glossary

Terminology	Definition

Terminology	Definition