Snake & Ladder

100	99 2^2	98	97	96	95	94 8^2	93	92	91
81 2^5	82	83	84	85	86	87 $3^3 \times 2$	88	89	90
80	79	78 42×1^5	77	76	75	74	73	72	71
61	62	63	64	65	66 $2^4 \times 3$	67	68	69	70 $5^2 \times 3$
60	59	58	57	56 $2^2 \times 7$	55	54	53	52	51 4^3
41	42	43 3^4	44	45	46	47	48	49 $3^2 \times 7$	50
40	39	38 $2^4 \times 5$	37	36	35	34 $4^2 \times 2$	33	32	31
21	22	23 $7^2 \times 2$	24	25	26	27	28 $4^2 \times 5$	29	30
20 $5^2 \times 2$	19	18	17	16 7^2	15	14	13	12	11 5^2
1	2	3 $3^2 \times 5$	4	5	6	7 6^2	8	9	10

How to play Snake and Ladders game :

- Start the game from 1. Proceed your turn alternately by tossing a die of Snake and Ladders.
- When you reach in the square where exponent form is written there, find its simple form to get value and then reach to that square having that simplified value.
- When any reaches to the square having 100, then start the game again.

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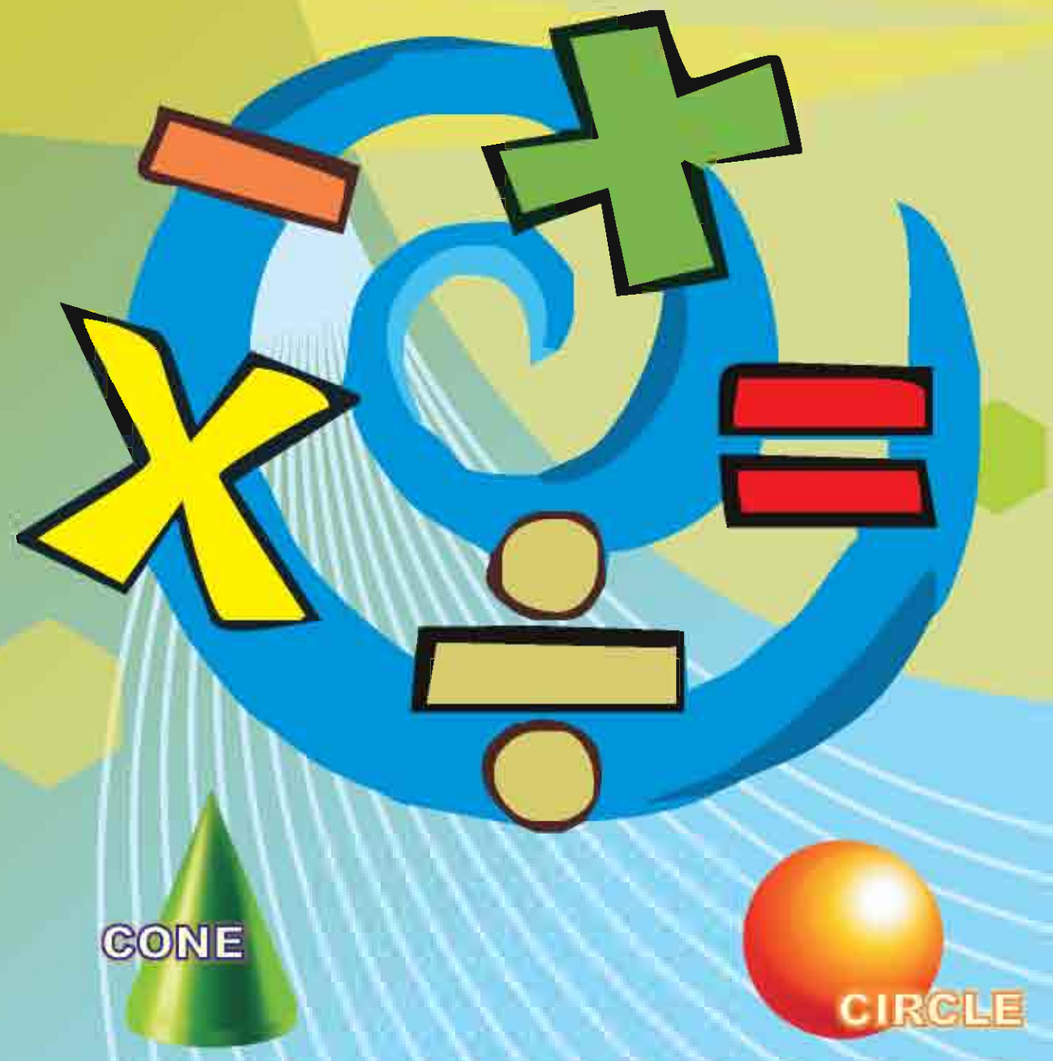
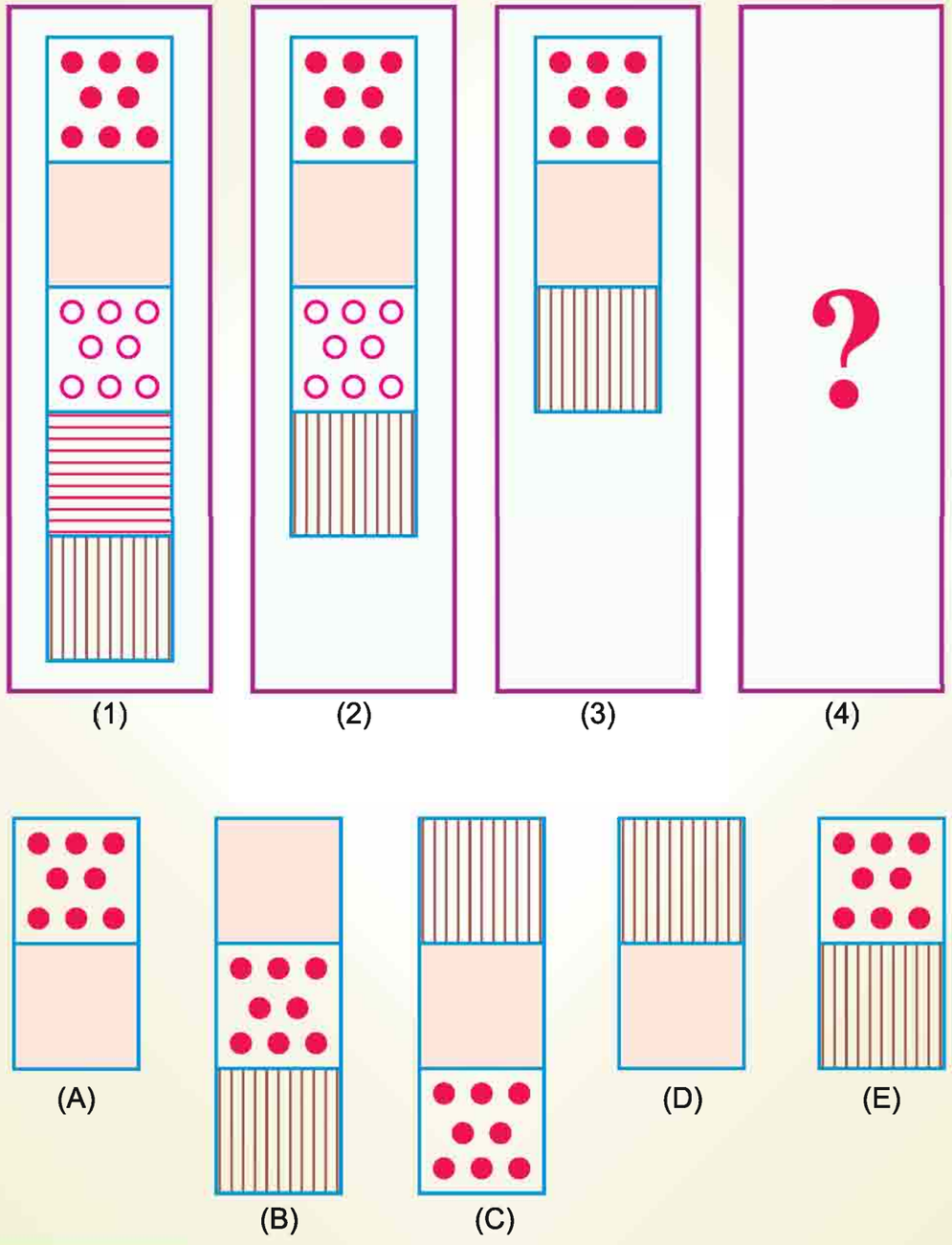
MATHEMATICS

Standard 6

(Semester II)



Think !!!



Different currencies of the world !

Country	Currency	Country	Currency
India	Rupee	Philippinece	Peso
Shrilanka	Shrilankan Rupee	Netharland	Gildar
Pakistan	Pakistan Rupee	Switzerland	Swiz Frank
China	Yuan	Russia	Rubal
Bangladesh	Taka	Iceland	Crona
Bhutan	Indian Rupee	Burma	Kayat
U.S.A.	Dollar	Iran	Riyal
Nepal	Nepalian Rupee	Irak	Iraki Dinar
Japan	Yen	Izarial	Izarialan Pound
Canada	Canadian Dollar	Italy	Lira
Australia	Dollar	Malesiya	Ringit
United Kingdom	Pound Stearling	Norve	Cron
Hongkong	Hongkong Dollar	Saudi Arabia	Riyal
Vietnam	Dong	Moresius	Moresius Rupee
Spain	Peseta	Mexico	Peso
Greece	Drakma	Egypt	Egyptian Pound
Newzeland	Newzeland Dollar	Portugal	Escudo
France	Frank	Nigeria	Naira
Denmark	Cron	North/South Koria	Won
Belgium	Belgium Frank	Yugoslavia	Dinar
Brazil	Cruziro	Indonesia	Rupiyah
Polant	Ziloti	Figi	Figian Dollar

(Reference-book : 'Vishwa ni Ashmita', Part 2, Page 313 to 315)

ગુજરાત શૈક્ષણિક સંશોધન અને તાલીમ પરિષદ, ગાંધીનગરના પત્ર-ક્રમાંક
જીસીઈઆરટી / અભ્યાસક્રમ / -થી મંજૂર

A 'Teacher's book' has been prepared for teachers and parents (separately). Kindly use this.

MATHEMATICS

Standard 6

(Semester II)

PLEDGE

India is my country.
All Indians are my brothers and sisters.
I love my country and I am proud of its rich and varied heritage.
I shall always strive to be worthy of it.
I shall respect my parents, teachers and all my elders and treat everyone with courtesy.
I pledge my devotion to my country and its people.
My happiness lies in their well-being and prosperity.

Price : ₹ 40.00

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Preparation and Planning :
Dr T. S. Joshi, Haresh Chaudhari, Iqbal D. Vora, Chandresh Palia

Convener :
Dr Vijay Patel

Co-convener :
Dr Sanjay Shah, M. A. Shekh, Jagdish Patel, Rashmikant Patel, Jivan Ramani

Authors :
Prakash Prajapati, Dhirubhai Panchal, Hitesh Prajapati, Gaurangbhai Patel, Pratik Patel, Parimal Patel, Jignesh Shah, Suchit Prajapati, Sanjaybhai Patel, Dhruvkumar Desai, Diptiben Ghodasara, Sonuben Gohel, Harshvardhan Jadeja, Komalben Zabuawala, Pankajgir Goswami, Chintankumar Shah, Pragnesh Upadhyay, Bharatkumar Prajapati, Radhaben Yadav, Suketukumar Yagnik, Nileshkumar Nathani, Ashok Parmar, Rajendrasinh Parmar, Ketan Patel

Translation :
Hemant R. Shah

Reviewer :
R. S. Bisht, N. M. Jaloria, C. M. Darji, K. N. Sharma, B. N. Thakkar

Language Reviewer :
Omprakash Dave

Artist :
Jayant Pranami, Smitaben Rana, Kanjibhai Parmar, Gaurishankar Mehta, Jyoti Khatri, Manish Parekh

Title Design :
Dharmesh Chavada

Lay-out and Planning
Shri Haresh S. Limbachiya
(Dy. Director : Production)

PREFACE

The National Curriculum Framework (NCF) 2005 and the Right to Education Act (RTE) 2009 recommends connecting knowledge that is provided in school to the life outside the school. This principle marks a departure from the legacy of book is learning which continues to shape our education system and is creating removes a huge gap between the school, home and community.

The syllabi and textbook developed on the basis of above principle signify an attempt to implement it with a considerable change in the textbooks, teaching-learning methods, approaches etc. Such textbooks will provide the scope to the students to learn individually, in pair, in group and as a whole class and provide self-learning, improve the application and consolidation abilities of the children. In such a scenario, the teacher will be just an initiator, facilitator and guide and will create learner dominant classes.

During the process of designing and developing the textbooks, the core group personnel coordinators, writers and reviewers got a lot of inspiration and motivation from the Chief Secretary of Elementary Education.

Also, the guidance from IGNUS-erg and co-operation of UNICEF was easily and continuously available to the group during the entire process of developing the textbooks. After implementing the textbooks as a part of the pilot study, due efforts were done to make it faultless. Now, it is in the hands of the users and beneficiaries.

GCERT welcomes constructive and creative comments and suggestions which will be useful to undertake further revision and refinement.

M. T. Shah
Director
Gujarat Council of Educational Research and Training
Gandhinagar

H. K. Patel GAS
Director
Gujarat State Board of School Textbooks
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FUNDAMENTAL DUTIES

It shall be the duty of every citizen of India :

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage or our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

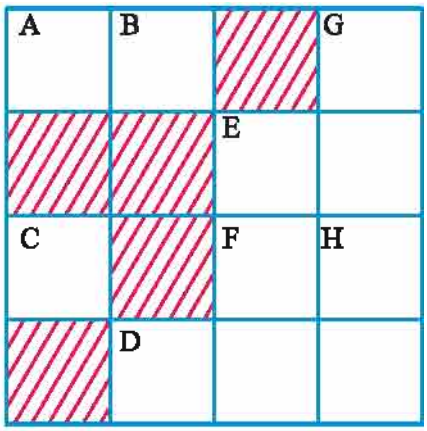
(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement.

INDEX

1 Integers

❖ Let us Remember :

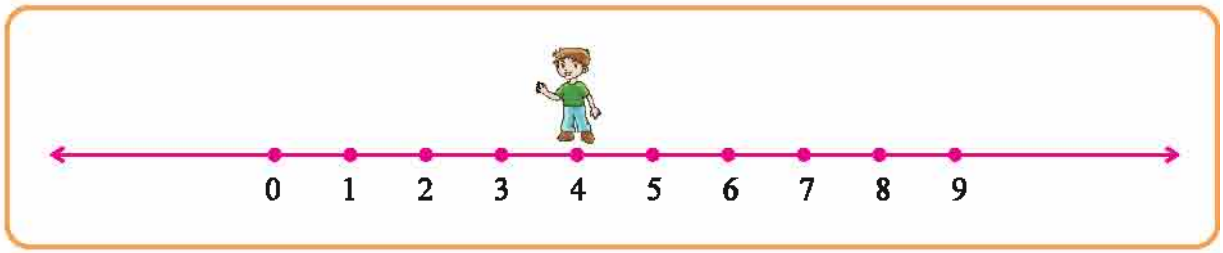
[1] Fill up the following table as per instructions :



Across Clue	Down Clue
(A) First natural number.	(A) Least natural no. of two digits.
(B) Least whole number.	(B) Neutral number for addition.
(C) The largest whole number of one digit.	(C) _____ × 3 = 3 × 6
(E) 0 + _____ = 25	(D) (5 × 3) × 60 = _____
(F) 1 × _____ = 50	(E) 4 × (_____ + 17) = (4 × 20) + (4 × 17)
(G) (18 + 20) + 30 = 18 + (20 + _____)	(F) An odd number on a numberline such that it is left side of 7 and right side of 3.
(H) 12 × (7 × _____) = (12 × 7) × 20	

[2] Illustrate 0, 2, 6 and 9 on a numberline.

- **Let us Learn New :**
  - **Understanding of negative integers and plotting of integers on a numberline.**



Here, 0 to 9 numbers are plotted on a numberline. At number 4 there is a cartoon.

(1) Cartoon moves one unit left from 4, where does it reach ? (4 − 1 = _____)

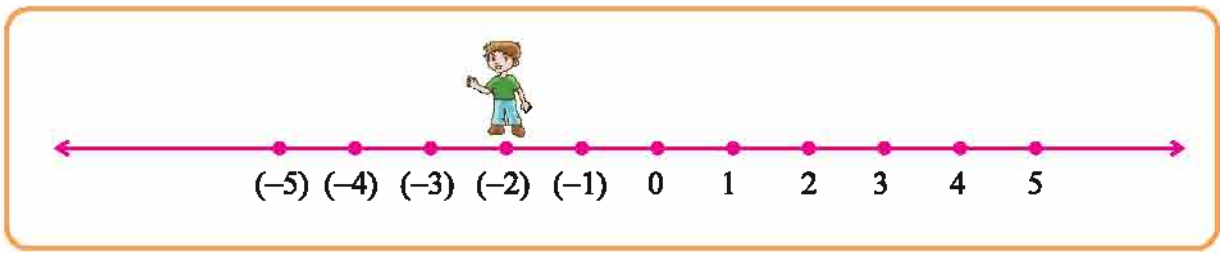
(2) Cartoon moves one unit left from 3, where does it reach ? (3 − 1= _____)

(3) It moves one unit left from 2, where does it reach ? (2 − 1 = _____)

(4) Now, it moves one unit left from 1, where does it reach ? (1 − 1 = _____)

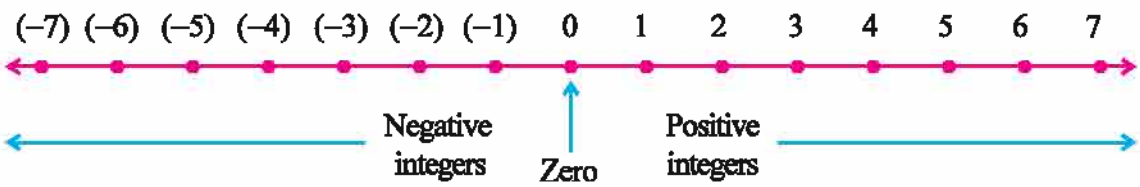
(5) Now, cartoon moves one unit left from 0, where does it reach ? _____

Alas ! You feel that there is no number on left side of 0. But friends, its not like this ! When we show numbers on right side of zero on a numberline, similarly there are number on left side of zeros.



Thus, (−1) is less than 0. Similarly, when we move left side, we get numbers like (−2), (−3), (−4),... . Numbers bigger than zero like 1, 2, 3,... are called positive integers. Same way, number less than zero like (−1), (−2), (−3), (−4), (−5),... are called negative integers. To show negative integers '−' (negative) sign is placed before them.

- Negative integers are less than 0, so they are plotted on left side of zero at equal distance like, (–1), (–2), (–3),... .
- Integers includes positive integers, zero and negative integers. It is shown on numberline as below :



- **0 is neither positive nor negative integer.**
- **Integers are infinite.**

Illustration 1 : Represent (–5) and 4 on a numberline.

Solution :

- First draw a line and decide the points on it at equal distance.
- Show 0 at mid part of a line. Show negative integers on left side of 0 and positive integers on right side of 0.
- Now, draw circle showing (–5) and 4.

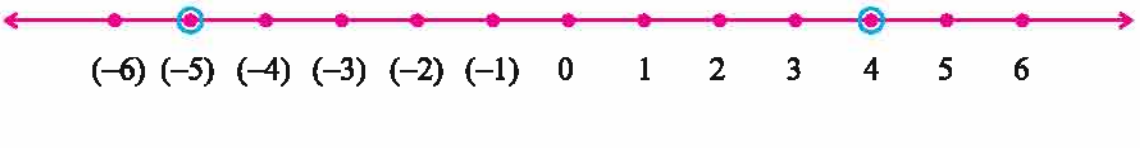


Illustration 2 : Represent 3 and (–6) on a numberline.

Illustration 3 : Represent 4, (–1) and (–3) on a numberline.

1. Fill in the blanks to make the statement correct :

(1) Negative integers are at _____ side of 0 on numberline.

(2) Positive integers are at _____ side of 0 on numberline.

(3) _____ is neither positive integer nor negative integer.

(4) Integers includes positive integers, zero and _____ integers.

2. Show the following numbers on a numberline :

(1) 0, 3 (2) 4, 6, (–6)

(3) (–3), 5, 8 (4) 2, (–4), (–1)

- **Order of integers with the help of numberline :**

As we know that out of any two numbers on a numberline the number, which is at left side is smaller number and the number, which is at right side is bigger number.

- **Answer the following on the basis of numberline :**

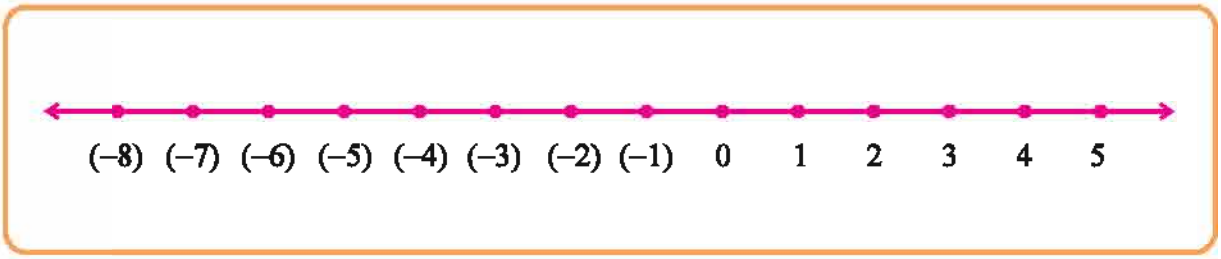
(1) Positive integers are at which side of zero ? _____

(2) Negative integers are at which side of zero ? _____

(3) Positive integers are at which side of negative integers ? _____

Thus, we said that zero is bigger than negative integers. Thus, positive integers are bigger than negative integers. As we move on left side on numberline, then we get smaller numbers. Similarly, as we move on right side, then we get bigger numbers.

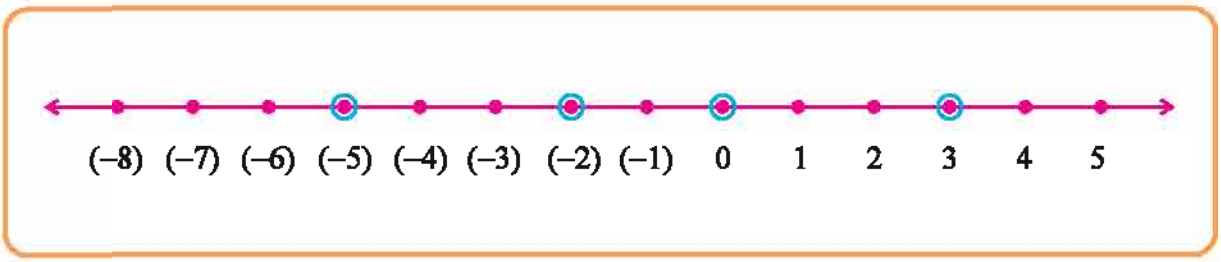
Illustration 4 : On the basis of given numberline answer the following questions :



(1) Arrange in ascending order : 0, (–2), 3, (–5)

Solution :

- Plot 0, (–2), 3, (–5) on a numberline.



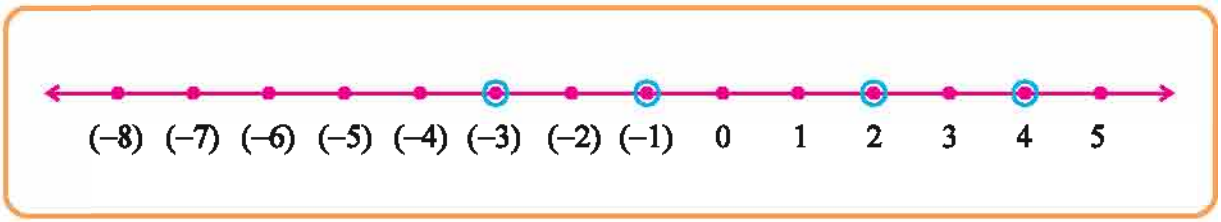
- Now, write the numbers plotted from left side to right side in correct order : (–5), (–2), 0, 3

∴ Ascending order = (–5), (–2), 0, 3

(2) Arrange in descending order : 2, (–1), (–3), 4

Solution :

- Plot 2, (–1), (–3) and 4 on a numberline.

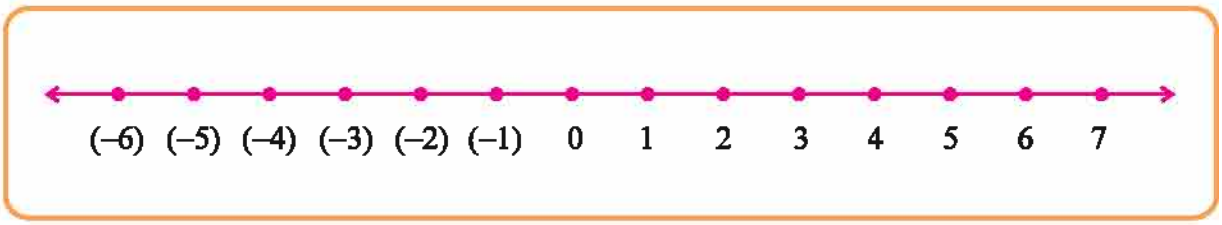


- Now, write numbers plotted from right side to left side in correct order : 4, 2, (–1), (–3).

∴ Descending order : = 4, 2, (–1), (–3)

(3) Write all the integers between (–3) and 4.

Solution :



Integers lie between (–3) and 4 are (–2), (–1), 0, 1, 2, 3.

Illustration 5 : Fill in the blanks by using appropriate sign of < and > :

(1) (–4) ..... $\leq$ (–2) (2) 4 ..... $\geq$ (–5) (3) (–2) ..... $\geq$ (–3)

(4) 0 ..... $\leq$ 3 (5) (–1) ..... $\leq$ 0 (6) (–6) ..... $\leq$ (–2)

Illustration 6 : Write the appropriate number in the following blanks :

(1) (–4) < ..... (–3) (2) ..... (–3) < (–2) (3) ..... 4 > ..... (–4)

Game (1) : Draw a numberline on a playground. Plot numbers from (–20) to 20. Ask any four students to come forward.

- Teacher will give one-one integer to each of the four students from (–20) to 20 integers.
- Teacher will tell all the four students to stand at their respective place on numberline.
- Fifth student will tell ascending or descending order of four integers according to the place of four students.

Game (2) :

- Teacher says any two integers.
- Two students stands on a numberline according to the integers given by the teacher.
- Third student will say integers falls in between the two students.

- Any positive integers is bigger than negative integers.
- Zero is bigger number than negative integers and smaller number than positive integers.

1. Fill in the blanks to make the statement correct :

(1) _____ is an integer between (–1) and 1.

(2) On a numberline, numbers on left side is _____ than numbers on right side.

(3) _____ is a bigger number, than any negative integers and smaller number than any positive integers.

(4) On a numberline _____ integers are shown on left side of zero.

2. Place appropriate sign < or > in the blank :

(1) (–2) _____ (–1)

(2) (–4) _____ (–6)

(3) (–12) _____ (–5)

(4) (–3) _____ (–6)

(5) 5 _____ (–3)

(6) (–6) _____ (–1)

(7) 0 _____ (–5)

(8) 0 _____ 7

(9) 5 _____ (–5)

(10) (–8) _____ 0

3. Fill in the blanks by placing appropriate number :

(1) $(-5) <$ _____ (2) _____ $< (-1)$

(3) _____ $>$ _____ (4) _____ $<$ _____

4. With the help of numberline, write integers lying between the given integers :

(1) (-7) and (-4) (2) 4 and 8 (3) (-2) and 2

(4) (-5) and (-1) (5) (-1) and 1

5. Arrange the following integers in an ascending order with the help of numberline :

(1) (-1), 0, 6, 4 (2) (-5), 4, (-1), 12

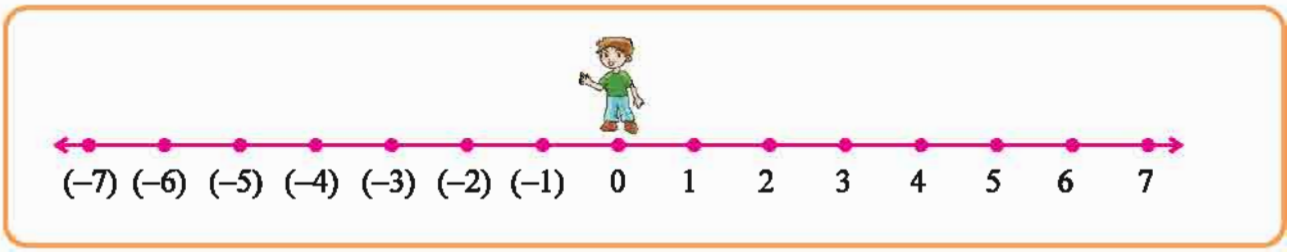
(3) (-1), 7, (-14), (-11)

6. Arrange the following integers in descending order with the help of numberline :

(1) 6, 0, (-1), 15 (2) (-18), (-3), (-2), (-7)

(3) (-3), 7, 9, (-8)

- **Addition of two integers with the help of numberline :**



Here, cartoon is at 0 on a numberline :

- If cartoon moves one unit right side from 0 on a numberline, then it will reach to ..... $(0 + 1 =$ _____$)$
- If it moves two units from 1 on right side, it will reach to ..... $(1 + 2 =$ _____$)$
- It it moves two units from 3 on right side, it will reach to ..... $(3 + 2 =$ _____$)$

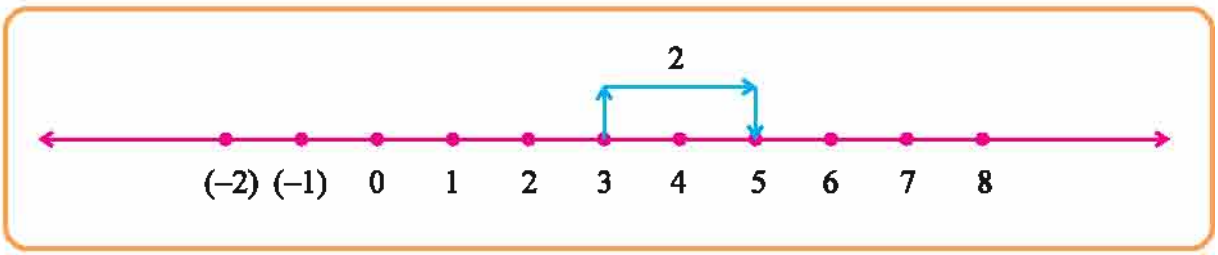
As we know that, $0 + 1 = 1$

$1 + 2 = 3$

$3 + 2 = 5$

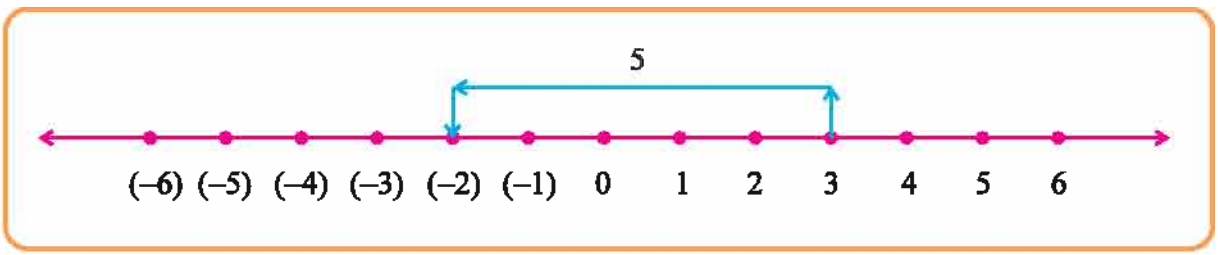
Thus, you can see that, to add positive integer one can move on right side on a numberline.

- Now, we try to understand the addition 3 + 2 = 5 through numberline.



Thus, we get 5 on moving two units from 3 to the right side.

- As we have to move right side to add positive integer on a numberline, similarly to add negative integer move on opposite side i.e. left side.
- Now, find 3 + (–5) with the help of numberline.

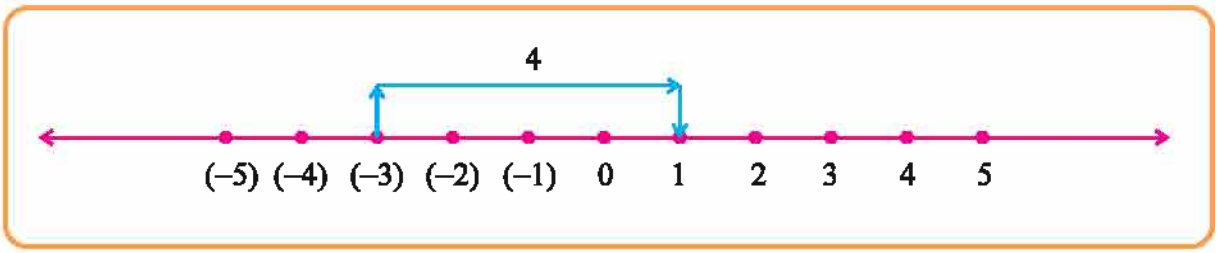


Here, we want to add (– 5) (negative integer) into 3. So, we have to move 5 units distance on left side from 3. Thus, as we move 5 units left side we reach to (–2).

∴ 3 + (–5) = (–2)

Illustration 7 : Find (–3) + 4 with the help of numberline.

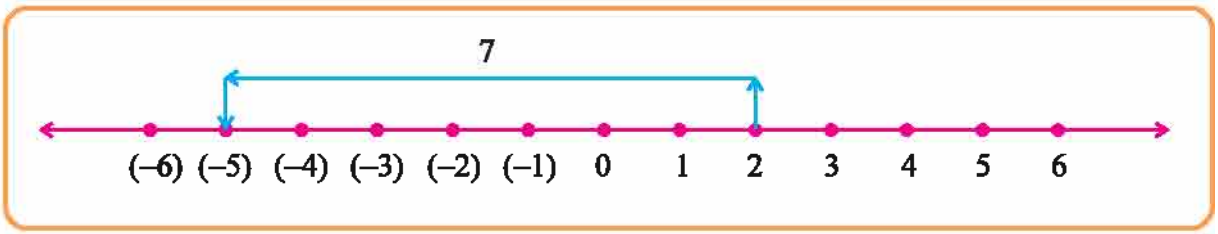
Solution : Here, we have to add positive integer, so we have to move right side. So as we move 4 units right side from (–3), we reach to 1.



∴ (–3) + 4 = 1

Illustration 8 : Find 2 + (−7) with the help of numberline.

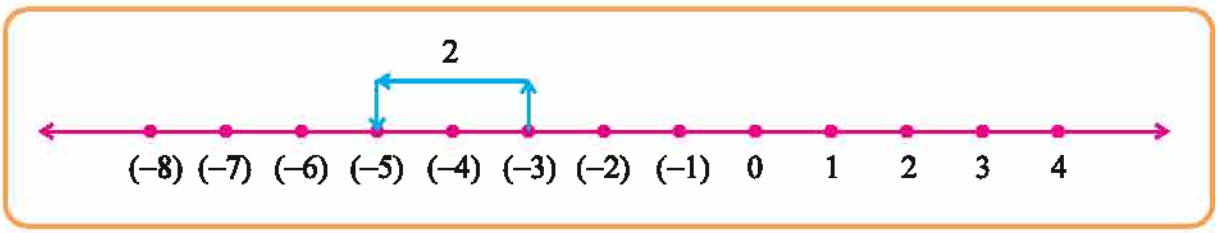
Solution : Here, to add negative integer, we have to move on left side. So, as we move 7 units on left side from 2 we reach to (−5).



∴ 2 + (−7) = (−5)

Illustration 9 : Find (−3) + (−2) with the help of numberline.

Solution : On moving two units left side from (−3), it comes to (−5).



∴ (−3) + (−2) = (−5)

- **To add integers with the help of numberline...**

(1) To add positive integers move on right side equal to that integer's unit distance.

(2) To add negative integers move on left side equal to that integer's unit distance.

1. Do following addition with the help of numberline :

(1) 2 + 4 (2) (−2) + 9 (3) 2 + (−5) (4) 0 + 5

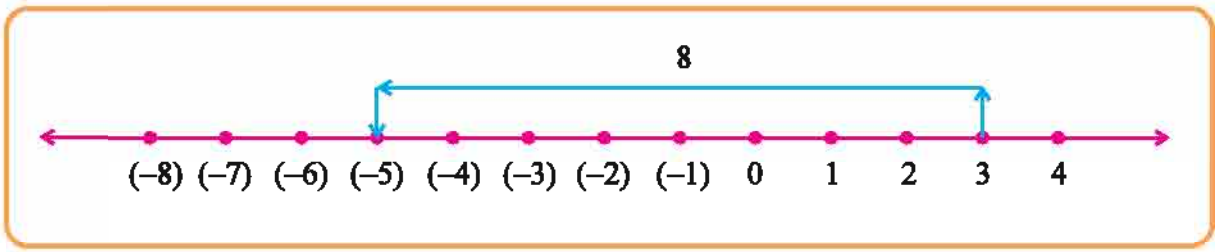
(5) 0 + (−4) (6) 8 + (−6) (7) (−4) + 9 (8) (−4) + (−5)

(9) 4 + (−10) (10) (−4) + 5 (11) (−5) + (−7) (12) 5 + (−8)

- **Subtraction of integers with the help of numberline :**

Illustration 10 : Find $3 - 8$ with the help of numberline.

Solution :

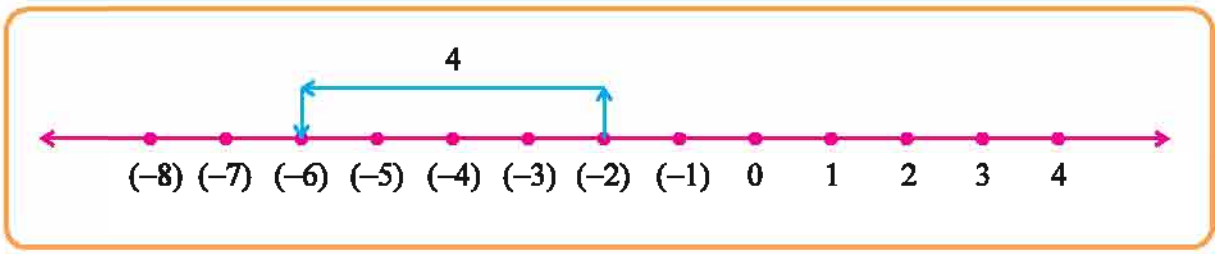


Here, we have to subtract 8 (positive integer) from 3. So, move 8 units left side from 3. Thus, on moving 8 units left side it comes to (-5).

$\therefore \quad 3 - 8 = (-5)$

Illustration 11 : Find $(-2) - 4$ with the help of numberline.

Solution :

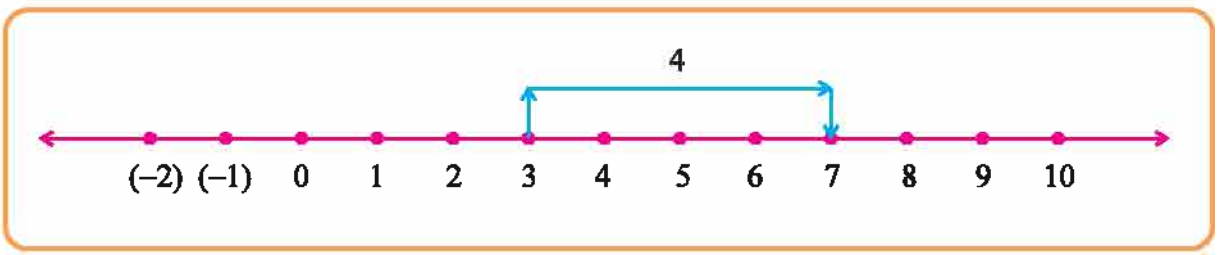


On moving 4 units left side from (-2), it comes (-6).

$\therefore \quad (-2) - 4 = (-6)$

Illustration 12 : Find $3 - (-4)$ with the help of numberline.

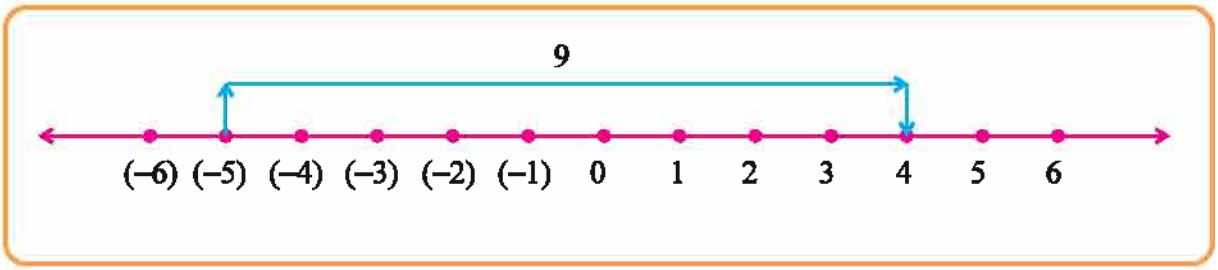
Solution :



Here, to subtract (–4) (negative integer) from 3, we have to move 4 units right side from 3. Thus, on moving 4 units it comes 7.

∴ 3 – (–4) = 7

Illustration 13 : Find (–5) – (–9) with the help of numberline.



Here, on moving 9 units from (–5) right side, it comes 4.

∴ (–5) – (–9) = 4

- **To substract integers with the help of numberline...**

(1) To subtract positive integers, move left side equal to that integer's unit distance.

(2) To subtract negative integers, move right side equal to that integer's unit distance.

1. Subtract the following with the help of numberline :

(1) 4 –1 (2) (–3) – 6 (3) 0 – 4

(4) 3 – (–6) (5) (–3) – (–2) (6) (–2) – (–5)

(7) 0 – (–6) (8) 1 – (–5) (9) (–2) – 7

(10) (–5) – (–4) (11) (–3) – (–4) (12) 5 – 9

- Integers includes positive integers, zero and negative integers.
- 0 is neither positive integer nor negative integer.
- Integers are infinite.
- Any positive integer is bigger than negative integers.
- Zero is bigger integer than negative integer and smaller integer than positive integer.

1. Write integers lying between of the following integers with the help of numberline :

(1) (–2) and 7 (2) (–10) and (–6) (3) 4 and (–1)

2. Arrange the following integers into ascending order with the help of numberline :

(1) (–5), 8, (–13), 0 (2) (–9), (–1), (–6), (–4)

(3) 3, (–2), (–6), (–3) (4) 1, (–5), 2, (–9)

3. Arrange the following integers in descending order with the help of numberline :

(1) (–6), 10, 0, (–1) (2) 7, (–5), (–1), 4

(3) 13, (–3), 4, (–2) (4) (–4), (–7), 0, (–2)

4. Do the following addition with the help of numberline :

(1) (–2) + (–5) (2) 7 + (–10)

(3) (–7) + 4 (4) (–5) + 10

(5) (–3) + 8 (6) 0 + (–7)

5. Do the following subtraction with the help of numberline :

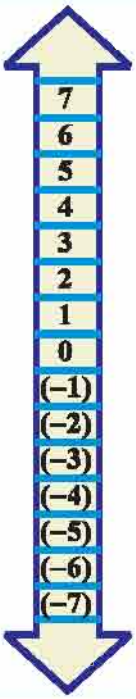
(1) $(-3) - (-9)$ (2) $8 - (-4)$

(3) $5 - 10$ (4) $(-5) - 4$

(5) $(-3) - 7$ (6) $2 - 8$

6. With the help of your teacher, form a group of two-two students. Now, in each group, one student speaks positive integer and the other student speaks negative integer. Now, add both integers. Similarly subtract those integers.

Instruction : You have to speak the integers lying between (-20) and 20.



- Draw a numberline on the ground as per the adjoing figure.
- Make a die such that on its three faces, positive numbers 1, 2, 3 are written and on remaining three faces negative numbers (-1), (-2), (-3) are written.
- Keep two coins for both the friends at zero.
- Now, throw die and move the coin as per die.
- Play this game turn by turn by throwing die 5 times.
- At last see the position of each coin and decide the winner according to the coin on bigger number than other.

Answers

Practice 1

1. (1) left (2) right (3) zero (4) negative

Practice 2

1. (1) 0 (2) small (3) zero (4) negative
2. (1) < (2) > (3) < (4) > (5) > (6) < (7) > (8) < (9) > (10) <
4. (1) (–6), (–5) (2) 5, 6, 7 (3) (–1), 0, 1
   (4) (–4), (–3), (–2) (5) 0
5. (1) (–1), 0, 4, 6 (2) (–5), (–1), 4, 12
   (3) (–14), (–11), (–1), 7
6. (1) 15, 6, 0, (–1) (2) (–2), (–3), (–7), (–18)
   (3) 9, 7 (–3), (–8)

Practice 3

1. (1) 6 (2) 7 (3) (–3) (4) 5 (5) (–4) (6) 2
   (7) 5 (8) (–9) (9) (–6) (10) 1 (11) (–12) (12) (–3)

Practice 4

1. (1) 3 (2) (–9) (3) (–4) (4) 9 (5) (–1) (6) 3
   (7) 6 (8) 6 (9) (–9) (10) (–1) (11) 1 (12) (–4)

Exercise

1. (1) (–1), 0, 1, 2, 3, 4, 5, 6 (2) (–9), (–8), (–7) (3) 0, 1, 2, 3
2. (1) (–13), (–5), 0, 8 (2) (–9), (–6), (–4), (–1)
   (3) (–6), (–3), (–2), 3 (4) (–9), (–5), 1, 2
3. (1) 10, 0, (–1), (–6) (2) 7, 4, (–1), (–5)
   (3) 13, 4, (–2), (–3) (4) 0, (–2), (–4), (–7)
4. (1) (–7) (2) (–3) (3) (–3) (4) 5
   (5) 5 (6) (–7)
5. (1) 6 (2) 12 (3) (–5) (4) (–9)
   (5) (–10) (6) (–6)

2 Types of Pair of Angles

❖ **Let us remember :**

Activity 1 : Measure the angle formed by two hands of a clock given in the following different pictures and write the measurement and type in the given ☐ :

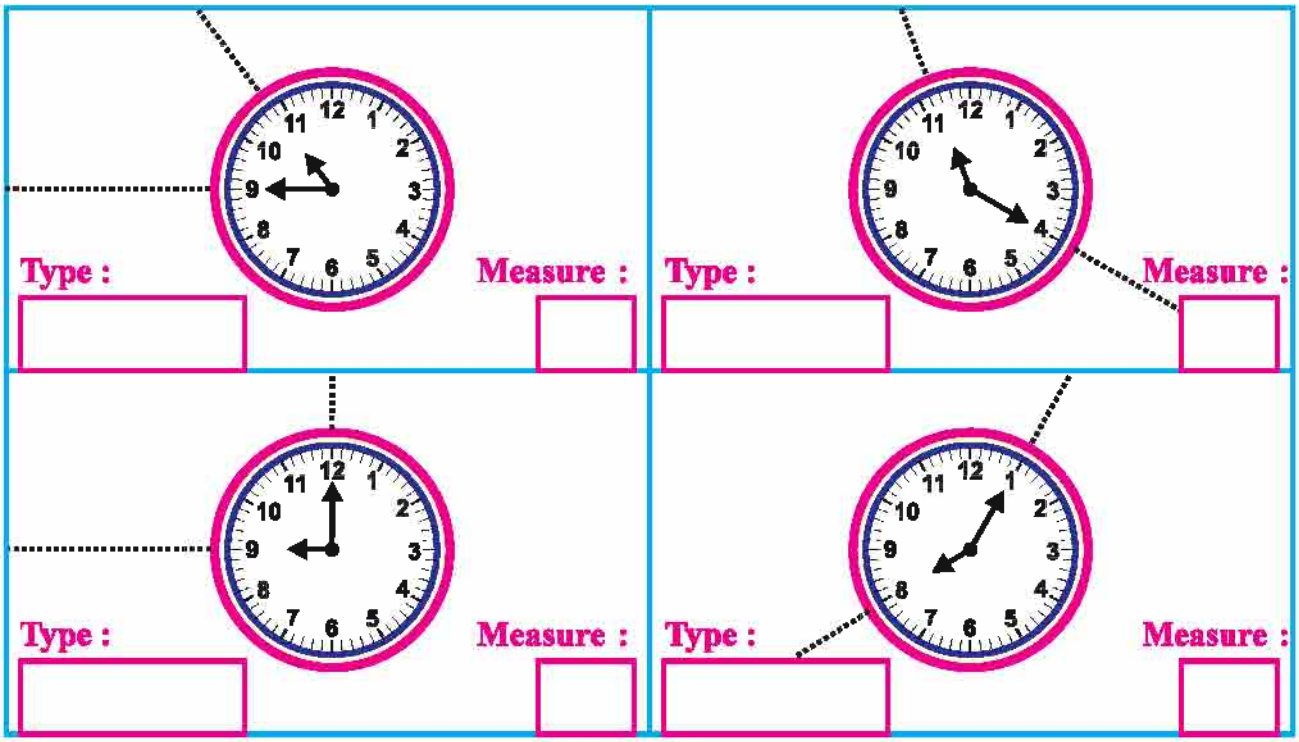
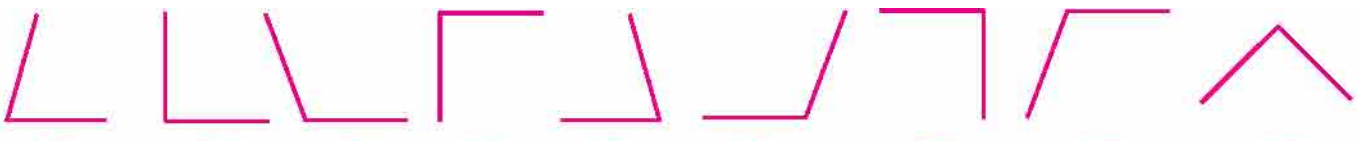


Figure 2.1

Activity 2 : Classify the following angles into given table :



Acute Angle	Right Angle	Obtuse Angle

- **Let us learn new :**
  - **Types of pair of angles :** Here, we try to understand different types of pair of angles with the help of relation between the measures of two angles.
- **Complementary Angles :**

Activity 3 : Measure the following angles. Write their measurement and addition of measure in the table :

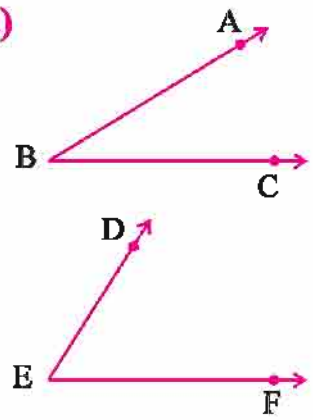
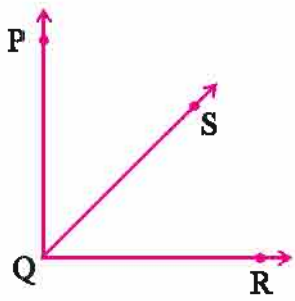
Figure	Measure of angles	Addition of measures of angles
(a) 	$m\angle ABC$ = ...° $m\angle DEF$ = ...°	$m\angle ABC + m\angle DEF$ = ...° + ...° = ...°
(b) 	$m\angle PQS$ = ... $m\angle RQS$ = ...	$m\angle PQS + m\angle RQS$ = ...° + ...° = ...°

Figure 2.2

Give answers from above figures :

(1) What is the measure of $\angle ABC$? .....

(2) What is the measure of $\angle DEF$? .....

(3) What is the sum of measures of both angles in fig. 2.2(a) ? .....

(4) What is the sum of measures of both angles in fig. 2.2(b) ? .....

- **If sum of the measure of two angles is 90°, then both the angles are called complementary angles to each other.**

If fig. 2.2(a) complementary angles of ∠ABC is ∠DEF and viceversa. Similarly in figure 2.2(b) ∠PQS and ∠ RQS are complementary angles to each other.

Here, $m\angle ABC + m\angle DEF = 90°$

$m\angle PQS + m\angle RQS = 90°$

In short, sum of the measure of complementary angles is 90°.

Complementary angle of given angle = 90° – measure of given angle.

Note : We can write measure ∠ABC as $m\angle ABC$.

Illustration 1 : Find complementary angle of 25°.

Solution : Here, we know that sum of the measure of both complementary angle is 90°.

Measure of complementary angle of 25° = 90° – 25° = 65°

∴ Complementary angle of 25° = 65°

Illustration 2 : Find complementary angle of 45°.

Solution : Sum of the measure of the pair of complementary angles is 90°.

Complementary angle of 45° = 90° – 45° = 45°

∴ Complementary angle of 45° = 45°

1. Write correct alternative in the given ☐ :

[1] What is the measure of complementary angle of 20° ? ☐

(1) 60° (2) 70° (3) 80°

[2] What is the measure of complementary angle of 55° ? ☐

(1) 25° (2) 15° (3) 35°

[3] What is the measure of complementary angle of 83° ? ☐

(1) 7° (2) 17° (3) 27°

2. Fill up the table on finding complementary angle of given angle :

	Angle-1	Angle-2
(1)	50°	.....
(2)	.....	63°
(3)	47°	.....

	Angle-1	Angle-2
(4)	56°	.....
(5)	.....	12°
(6)	67°	.....

3. Find complementary angle of 23°.

4. Find complementary angle of 36°.

5. Which pair of given angle is complementary and which are not ?

[1] 15°, 75° [2] 76°, 47° [3] 64°, 26°

[4] 50°, 40° [5] 33°, 66° [6] 20°, 70°

6. Write measures of any three acute angles. Also write their complementary angles.

- **Supplementary Angles :**

Activity 4 : Measure the following angle and write the sum of their measure in the table.

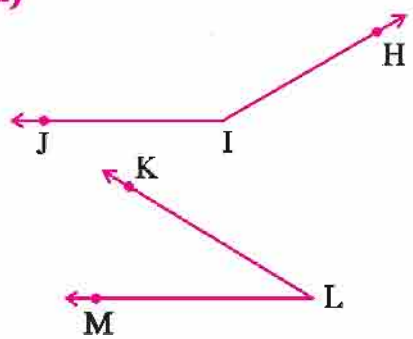
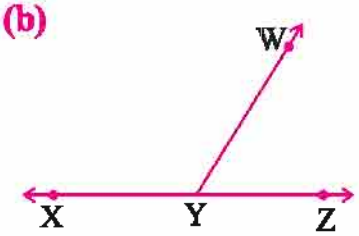
Figure	Measures of angle	Sum of measure of angle
(a) 	$m\angle HIJ$ = ...° $m\angle KLM$ = ...°	$m\angle HIJ + m\angle KLM$ = ...° + ...° = ...°
(b) 	$m\angle WYZ$ = ...° $m\angle WYX$ = ...°	$m\angle WYZ + m\angle WYX$ = ...° + ...° = ...°

Figure 2.3

Answer the following questions on the basis of fig. 2.3.

(1) What is the measure of ∠KLM ? _____

(2) What is the sum of $m\angle$KLM and $m\angle$HIJ ? _____

(3) What is the sum of $m\angle$WYZ and $m\angle$WYX ? _____

- **If sum of the measure of two angles is 180°, then both the angles are called supplementary angles to each other.**

In fig. 2.3(a), supplementary angle of ∠HIJ is ∠KLM and supplementary angle of ∠KLM is ∠HIJ. It means ∠HIJ and ∠KLM are supplementary angles to each other. Similarly in fig. 2.3(b), ∠WYZ and ∠WYX are also supplementary angles to each other.

In pair of supplementary angles sum of the measures of both the angle is 180°.

Measure of supplementary angle of given angle
= 180° – measure of given angle.

Note : Complementary angles and supplementary angles are two angles formed from one origin or formed from two different origin.

Illustration 3 : Find the measure of supplementary angle of 135°.

Solution : Sum of the measure of supplementary angle is 180°.

Supplementary angle of 135° = 180° – 135° = 45°

∴ Measure of supplementary angle of 135° = 45°.

Activity 5 :

From the following angles make a pair of complementary angles and supplementary angles, also write it in the table :

45°, 65°, 120°, 55°, 23°, 75°, 25°, 81°, 105°, 145°, 60°, 67°, 35°, 99°

No.	Pair of complementary angles	Pair of supplementary angles
(1)	35°, 55°	110°, 70°
(2)		
(3)		
(4)		
(5)		
(6)		
(7)		

Practice 2

1. Write the measure of supplementary angle of the given angles :

(1) 47° (2) 75° (3) 112° (4) 90° (5) 109°
(6) 100° (7) 81° (8) 60° (9) 145° (10) 132°

2. Two angles are supplementary angles. If measure of one angle is 66°, then find the measure of another angle.

3. Two angles are supplementary angles. If measure of both angles are equal, then find their measures.

- **Angles of Linear Pair :**

Activity 6 : Fill up the table according to the given diagram :

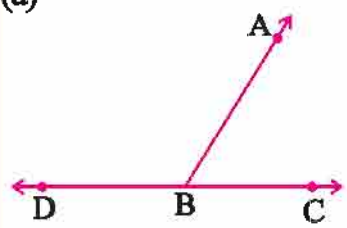
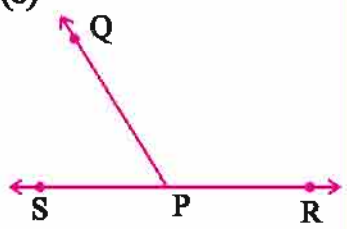
Figure	Common arm	Opposite ray	Sum of measure of angles
(a)  Figure 2.4	$\overrightarrow{BA}$	$\overrightarrow{BC}$ and $\overrightarrow{BD}$	$m\angle ABD + m\angle ABC$ = ...° + ...° = ...°

Figure	Common arm	Opposite ray	Sum of measure of angles
(b)  Figure 2.5	.....	..... and	$m\angle SPQ + m\angle RPQ$ = ...° + ...° = ...°

- **Two angles having one arm common and other two arms forming opposite rays to each other are called linear pairs. The sum of the measure of angles of linear pair is 180°.**

In fig. 2.4, ∠ABD and ∠ABC are angles of linear pair. Similarly in fig. 2.5, ∠SPQ and ∠RPQ are angles of linear pair.

Note : Angles of linear pair is supplementary angles, but each pair of supplementary angle does not form angles of linear pair.

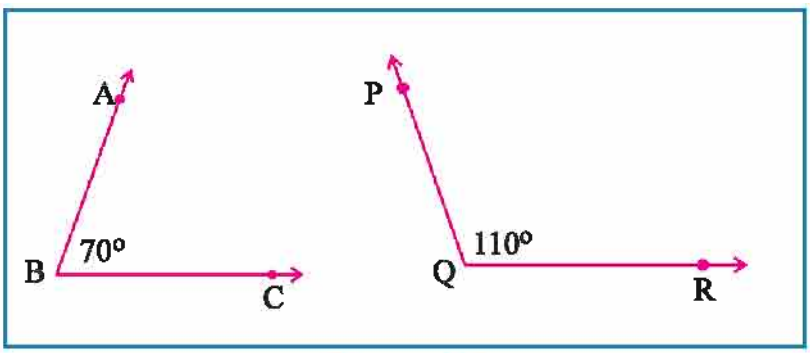


Figure 2.6

∠ABC and ∠PQR	Supplementary angles.
	Not the angles of linear pair.

In fig. 2.6, $m\angle ABC + m\angle PQR = 70° + 110° = 180°$

∴ ∠ABC and ∠PQR are supplementary to each other. ∠ABC and ∠PQR have no common arm, therefore they are not angles of linear pair.

Illustration 4 : Measure of one angle of a linear pair is 75°, then find measure of another angle.

Solution : As we know that sum of the measure of angles of linear pair is 180°.

∴ Measure of another angle of linear pair = 180° − 75° = 105°.

∴ Measure of another angle of linear pair is 105°.

Illustration 5 : Measure of an angle forming a linear pair is 67°, then find the measure of the other angle.

Solution : Sum of the measure of angle of linear pair = 180°.

∴ Measure of another angle of linear pair = 180° − 67° = 113°.

∴ Measure of another angle of linear pair is 113°.

1. Measure of one angle of linear pair is given. Find the measure of another angle :

(1) 20° (2) 130° (3) 111° (4) 50° (5) 85° (6) 107° (7) 155°

2. Measure of one angle of linear pair is 82°, find the measure of another angle.

3. One angle of linear pair is a right angle, then find the measure of another angle.

4. Measure of one angle of linear pair is 108°, then find the measure of another angle.

5. Make a pair of angles forming linear pair from the following angles :

27°, 90°, 130°, 80°, 35°, 50°, 145°, 100°, 90°, 153°

❖ Vertically Opposite Angles :

In fig. 2.7 $\overleftrightarrow{GJ}$ and $\overleftrightarrow{HP}$ both intersect each other at point B.

Four angles are formed by the intersection of $\overleftrightarrow{GJ}$ and $\overleftrightarrow{HP}$ at point B.

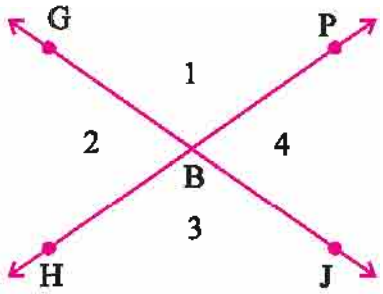


Figure 2.7

∠1 means ∠GBP

∠2 means ∠GBH

∠3 means ∠JBH

∠4 means ∠JBP

Here, ∠1 and ∠3, also ∠2 and ∠4 are opposite angles to each other, so they are called vertically opposite angles.

- **Out of four angles formed by two intersecting lines, a pair of opposite angles is called vertically opposite angles.**

In figure, ∠GBP and ∠JBH are one pair of vertically opposite angles. Also ∠GBH and ∠JBP are another pair of vertically opposite angles.

∠1 and ∠2 are angle of linear pair.

$\therefore \quad m\angle 1 + m\angle 2 = 180°$

Also, ∠2 and ∠3 are angles of linear pair.

$\therefore \quad m\angle 2 + m\angle 3 = 180°$

Thus, $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$

$\therefore \quad m\angle 1 = m\angle 3$

Similarly, $m\angle 2 = m\angle 4$

Thus, measures of opposite angles are equal.

- **Two pairs of vertically opposite angles are formed by the intersection of two lines.**
- **Measure of vertically opposite angles are equal.**

Illustration 6 : $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersects each other at point E. If measure of ∠AED is 70°, then find the measure of remaining three angles.

Solution : ∠AED and ∠CEB are vertically opposite angles.

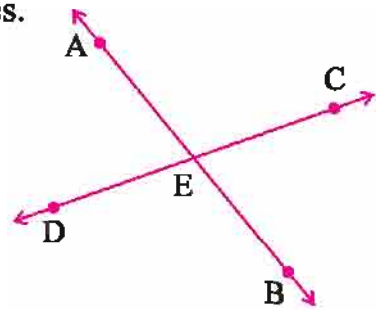


Figure 2.8

∴ $m\angle AED = m\angle CEB$, but $m\angle AED = 70°$.

∴ $m\angle CEB = 70°$

∠AED and ∠AEC are angles of linear pair.

∴ $m\angle AED + m\angle AEC = 180°$

∴ $m\angle AEC = 180° - 70°$

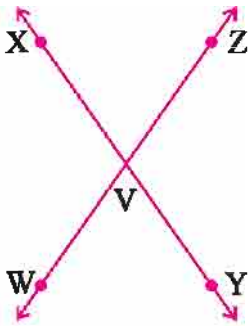
∴ $m\angle AEC = 110°$

∴ $m\angle DEB = 110°$ (∵ vertically opposite angle of ∠AEC)

Thus, $m\angle AEC = 110°$, $m\angle CEB = 70°$ and $m\angle DEB = 110°$

- **Think :**
  - Pair of two angles, other than vertically opposite angles, are called which type of angle ?
  - If two line segments or rays intersect each other, then also vertically opposite angles are formed ?

1. Fill in the blanks to make each statement correct from adjoining figure :



(1) Vertically opposite angle of ∠XVZ is ..... .

(2) Vertically opposite angle of ∠XVW is ..... .

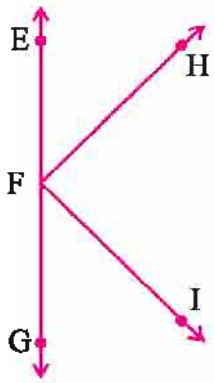
(3) $m\angle XVW = 120°$ then,

(i) $m\angle WVY$ = ... and

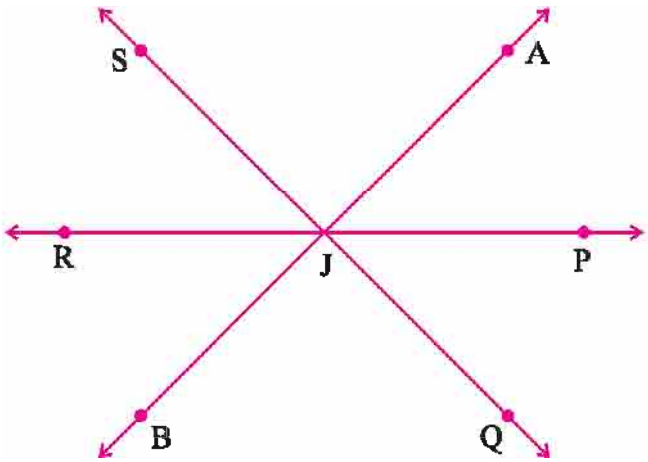
(ii) $m\angle XVZ$ = ...

2. $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect each other at point O. Measure of one angle is 56°, then find measure of other three angles.

3. From the given figure write two pairs of supplementary angles :



1. From the figure given below, write types of pair of angles and also write possible pairs against each type of angle :



2. From the following pair of angles, which pair is of complementary angle and which pair is of supplementary angle ?

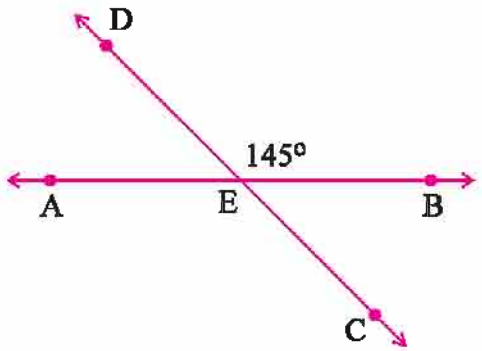
(1) 27°, 63° (2) 110°, 70° (3) 7°, 83°

(4) 135°, 45° (5) 58°, 32° (6) 52°, 128°

3. Find the measure of complementary and supplementary angles and fill the table :

	Measure of an angle	Measure of its complementary angle	Measure of its supplementary angle		Measure of an angle	Measure of its complementary angle	Measure of its supplementary angle
(1)	72°			(6)	25°		
(2)	50°			(7)	48°		
(3)	80°			(8)	67°		
(4)	87°			(9)	34°		
(5)	36°			(10)	71°		

4. $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ intersect each other at point E. $m\angle BED = 145°$, then find the measure of remaining angles.



5. Answer the following questions from the adjoining figure :

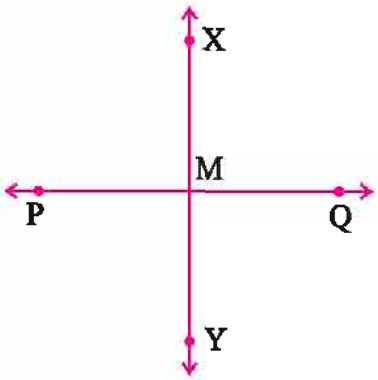
(1) How many pairs of vertically opposite angles are formed ?

(2) Write all pairs of vertically opposite angles.

(3) How many pairs are formed of angles of linear pair ?

(4) Write all pairs of angles of linear pair.

(5) If $m\angle XMQ = 90°$, then find the measure of remaining three angles.



- **Now say :**
- **Where do you find angles ?**

Like,

- Between the edge of table and its feet.
- Between the wall and ceiling of house.
- _____
- _____
- _____
- _____

- **Where do you find triangle ?**

Like,

- Radium triangle behind the bus.
- _____
- _____
- _____
- _____

- **Do you know ? Mason uses the set-square to construct home. Note down the use of set-square while constructing house. You may visit of some houses nearby you.**

_____

_____

_____

_____

◆

Answers

Practice 1

1. (1) 70° (2) 35° (3) 7°

2. (1) 40° (2) 27° (3) 43° (4) 34° (5) 78° (6) 23° **3.** 67° **4.** 54°

Practice 2

1. (1) 133° (2) 105° (3) 68° (4) 90° (5) 71° (6) 80° (7) 99° (8) 120° (9) 35° (10) 48° **2.** 114° **3.** 90°

Practice 3

1. (1) 160° (2) 50° (3) 69° (4) 130° (5) 95° (6) 73° (7) 25°

2. 98° **3.** 90° **4.** 72° **5.** 27° and 153°, 90° and 90°, 130° and 50°, 80° and 100°, 35° and 145°

Practice 4

1. (1) ∠WVY (2) ∠YVZ (3) (i) 60° (ii) 60°

2. 56°, 124°, 124°, **3.** ∠EFI and ∠GFI, ∠EFH and ∠GFH

Exercise

2. **Pair of angles of linear pair :** (2) 110°, 70° (4) 135°, 45° (6) 52°, 128°

Pair of complementary angles : (1) 27°, 63° (3) 7°, 83° (5) 58°, 32°

3.

	Measure of an angle	Measure of its complementary angle	Measure of its supplementary angle		Measure of an angle	Measure of its complementary angle	Measure of its supplementary angle
(1)	72°	18°	108°	(6)	25°	65°	155°
(2)	50°	40°	130°	(7)	48°	42°	132°
(3)	80°	10°	100°	(8)	67°	23°	113°
(4)	87°	3°	93°	(9)	34°	56°	146°
(5)	36°	54°	144°	(10)	71°	19°	109°

4. $m\angle AED = 35°$, $m\angle AEC = 145°$, $m\angle BEC = 35°$

5. (1) Two (2) ∠XMQ and ∠PMY, ∠XMP and ∠YMQ (3) Four (4) ∠XMQ and ∠QMY, ∠QMY and ∠YMP, ∠YMP and ∠PMX, ∠PMX and ∠XMQ (5) $m\angle XMP = 90°$, $m\angle PMY = 90°$, $m\angle YMQ = 90°$

3 LCM and HCF

Dear friends !! Let us play a game. Name of the game is "Khichadi-Kadhi". (Hotch-Potch-Curry)

First of all sit on the ground and form a circle. First student says 1, second says 2, third says 3, in this manner say up to 100. The student who says multiple of 5, he has to say 'Khichadi' ! Similarly instead of multiple of 6, one has to say 'Kadhi' ! The digit, which is multiple of 5 and 6 one has to say 'Khichadi-Kadhi' !

- **Think :**
  - For which number one said 'Khichadi' ?
  - For which number one said 'Kadhi' ?
  - For which number one said 'Khichadi-Kadhi' ?
  - Which number come first, for that one said 'Khichadi-Kadhi' ?
- **Let us remember :**

Complete the table by writing successive multiple of given digits :

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2	4													
3	6													
4	8													
5	10													
6	12													
7	14													
8														
9														
10														
11														
12														
13														
14														
15														

- **Let us learn new :**

Think and then say according to above table :

- Which are the multiple of 2 ? _____
- Which are the multiple of 3 ? _____
- Which are the similar multiple of 2 and 3 ? _____

Similar multiples of given numbers are called common multiple of given numbers.

Note : There are infinite multiples for any numbers. Thus, there are infinite common miltiples for these numbers.

So, now find common multiples of 4 and 6.

Multiples of 4 : ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Multiples of 6 : ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Common multiples of 4 and 6 _____

Which is the smallest common multiple of 4 and 6 ? ☐

Smallest number means least number.

The smallest common multiple means least common multiple. In short, least common multiple is called LCM. It means LCM of 4 and 6 is ☐.

Illustration 1 : Find LCM of 15 and 25 :

Multiple of 15 : 15, 30, 45, 60, (75), 90, 105, 120, 135, (150), ...

Multiple of 25 : 25, 50, (75), 100, 125, (150), 175, 200, ...

Common multiples of 15 and 25 : 75, 100, ...

The least common multiples of 15 and 25 is 75.

Thus, LCM of 15 and 25 is 75.

Illustration 2 : Find LCM of 6, 10 and 15.

Multiples of 6 : 6, 12, 18, 24, (30), 42, 48, 54, (60), ...

Multiples of 10 : 10, 20, (30), 40, 50, (60), 70, ...

Multiples of 15 : 15, (30), 45, (60), 75, 90, ...

Common multiples of 6, 10 and 15 are 30, 60,...

Thus, LCM of 6, 10 and 15 is 30.

Illustration 3 : Find the LCM of 5 and 7.

Multiples of 5 : 5, 10, 15, 20, 25, 30, (35), 40, 45, 50, 55, 60, 65, (70),...

Multiples of 7 : 7, 14, 21, 28, (35), 42, 49, 56, 63, (70), 77, ...

Common multiples of 5 and 7 are 35, 70, ...

Thus, LCM of 5 and 7 is 35.

Now, find LCM by taking any two or three prime numbers.

- LCM is exactly divisible by all given numbers. Thus, LCM is the biggest number of all given numbers or bigger than those numbers.
- LCM of two or more prime numbers is the product of those numbers.

- **Second method to find LCM (Division method)**

Illustration 4 : Find LCM of 12 and 16.

Explaination : Divide 12 and 16 by prime division method.

2	12	16
2	6	8
2	3	4
2	3	2
3	3	1
	1	1

- 12 and 16 divides by 2 gives 6 and 8 respectively.
- 6 and 8 divides by 2 gives 3 and 4 respectively.
- 3 is not exactly divisible, but 4 divides by 2 gives 2. So, below 3, write 3 and below 4 write 2.
- Again 2 divides by 2 gives 1 and 3 is written below 3.
- Now, 3 divides by 3 gives 1.
- Thus, divides each numbers by prime numbers 2, 3, 5, 7,... untill the result (quotient) is 1.
- Thus, at the end of the division, multiplication of all prime numbers found on left side is the LCM of given numbers.

Thus, LCM of 12 and 16 is

$= 2 \times 2 \times 2 \times 2 \times 3$

$= 48$

$\therefore$ LCM of 12 and 16 is 48.

Illustration 5 : Find LCM of 10, 20 and 25.

2	10	20	25
2	5	10	25
5	5	5	25
5	1	1	5
	1	1	1

Thus, LCM of 10, 20 and 25 is

$= 2 \times 2 \times 5 \times 5$

$= 100$

Thus, LCM of 10, 20 and 25 is 100.

Practice 1

1. Find LCM by giving multiples :

(1) 6 and 10 (2) 9 and 18

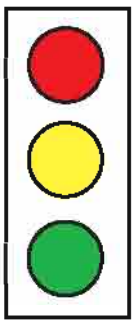
(3) 12, 18 and 24 (4) 5,10 and 15

2. Find LCM by division method :

(1) 10 and 12 (2) 24 and 30

(3) 3, 9 and 15 (4) 11, 22 and 33

3. In a series, red light blinks after every 2 seconds, green light blinks after every 6 seconds and yellow light blinks after every 10 seconds. If all three lights starts simultaneously, then after how many seconds they blink together ?



- Find the factors of 20 :

$1 \times 20 = 20$

$2 \times 10 = 20$

$4 \times 5 = 20$

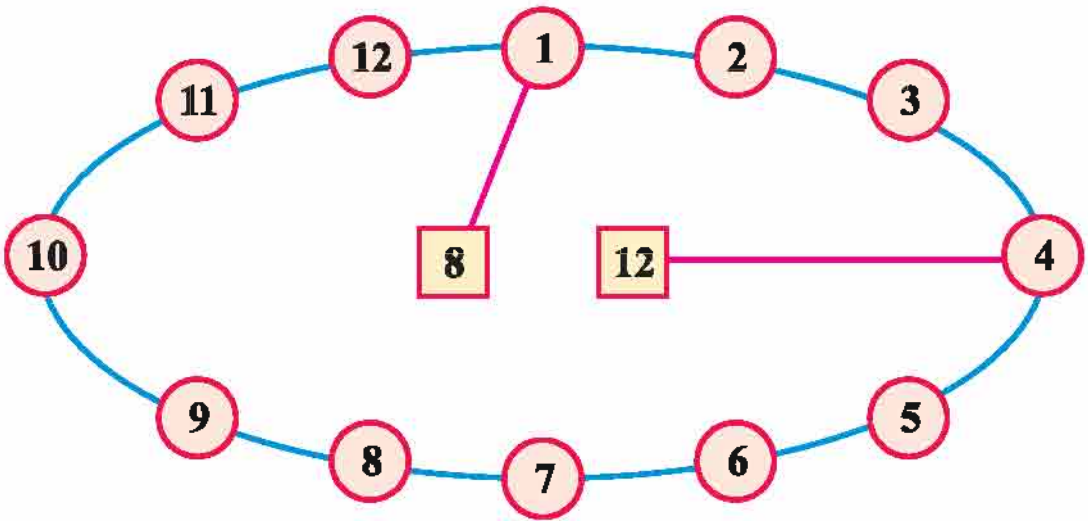
∴ **Factors of 20 :** 1, 2, 4, 5, 10, 20

Similarly find factors of given numbers :

(1) 25 (2) 56 (3) 16 (4) 36 (5) 70 (6) 72

- **Let us learn new :**

From the earlier prepared table (on page 30), find out 8 and 12 lies in table of which number and make a pair :



The given numbers lies in the table of which numbers, then those numbers are called factors of given number.

Think and say :

- What are the factors of 8 ? _____
- What are the factors of 12 ?_____
- What are the same factors of 8 and 12 ? _____

Same factors of the given numbers are called common factors of all the given numbers.

So, now find factors of 10 and 15 :

Factors of 10 : _____

Factors of 15 : _____

Common factors of 10 and 15 : _____

- Which is the smallest common factor of 10 and 15 ? ☐
- Which is the biggest common factor of 10 and 15 ? ☐

The biggest means the most or greatest or highest.

The biggest common factor means Highest Common Factor. In short it is called HCF Therefore, HCF of 10 and 15 is ☐ .

Illustration 6 : Find HCF of 32 and 48.

$1 \times 32 = 32$

$2 \times 16 = 32$

$4 \times 8 = 32$

$1 \times 48 = 48$

$2 \times 24 = 48$

$3 \times 16 = 48$

$4 \times 12 = 48$

$6 \times 8 = 48$

Factors of 32 : (1), (2), (4), (8), (16), 32

Factors of 48 : (1), (2), 3, (4), 6, (8), 12, (16), 24, 48

Common factors of 32 and 48 : 1, 2, 4, 8, 16

Highest Common Factor of 32 and 48 is 16.

Therefore, HCF of 32 and 48 is 16.

Illustration 7 : Find HCF of 12, 24 and 42.

$1 \times 12 = 12$	$1 \times 24 = 24$	$1 \times 42 = 42$
$2 \times 6 = 12$	$2 \times 12 = 24$	$2 \times 21 = 42$
$3 \times 4 = 12$	$3 \times 8 = 24$	$3 \times 14 = 42$
	$4 \times 6 = 24$	$6 \times 7 = 42$

Factors of 12 : (1), (2), (3), 4, (6), 12

Factors of 24 : (1), (2), (3), 4, (6), 8, 12, 24

Factors of 42 : (1), (2), (3), (6), 7, 14, 21, 42

Common factors of 12, 24 and 42 are : 1, 2, 3, 6. Out of these the highest factor is 6.

Thus, HCF of 12, 24 and 42 is 6.

Illustration 8 : Find HCF of 7 and 11.

Factors of 7 : (1), 7

Factors of 11 : (1), 11

HCF of 7 and 11 is 1.

- **Now, find HCF for any two or three prime numbers.**

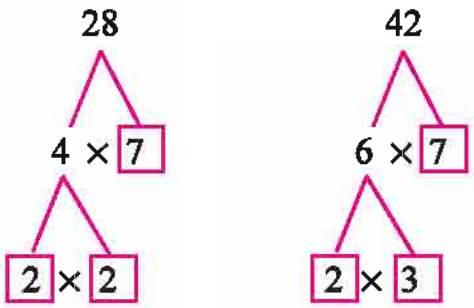
- All the given numbers are exactly divisible by their HCF. Thus, HCF is the smallest number of given numbers or even smaller than those numbers.
- HCF of two or more than two prime numbers is 1.
- 1 is the least factor of any numbers. So, for two or more than two numbers, the least common factor is 1.

- **Second method to find HCF (Method of prime factor)**

Illustration 9 : Find HCF of 28 and 42.

There are two methods for prime factorization of 28 and 42.

Method 1 :



Method 2 :

2	28
2	14
7	7
	1

2	42
3	21
7	7
	1

Thus, $28 = (2) \times 2 \times (7)$

$42 = (2) \times 3 \times (7)$

Product of common prime factors of 28 and 42 means HCF of 28 and 42.

Thus, HCF of 28 and 42 is $= 2 \times 7 = 14$

Thus, HCF of 28 and 42 is 14.

Illustration 10 : Find HCF of 40, 60 and 80.

2	40
2	20
2	10
5	5
	1

2	60
2	30
3	15
5	5
	1

2	80
2	40
2	20
2	10
5	5
	1

Thus, $40 = (2) \times (2) \times 2 \times (5)$

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

$80 = (2) \times (2) \times 2 \times 2 \times (5)$

Thus, HCF of 40, 60 and 80 $= 2 \times 2 \times 5 = 20$

Thus, HCF of 40, 60 and 80 is 20.

Illustration 11 : To prepare some flower bouquet a gardner used 54 rose flowers. In each flower bouquet he kept equal numbers of roses. Also he kept equal number of marigold flowers in each flower bouquet. So, 81 marigold flowers are used. Find at the most how many flower bouquet are prepared by the gardner ?

- 54 roses are used to prepare flower bouquet. Thus, number of flower bouquet is the factor of 54.
- In these all flower bouquet, marigold flower are kept in equal numbers, then 81 marigold flowers are used. Thus, number of maximum flower bouquets prepared are HCF of 54 and 81.

2	54
3	27
3	9
3	3
	1

3	81
3	27
3	9
3	3
	1

$54 = 2 \times (3) \times (3) \times (3)$

$81 = 3 \times (3) \times (3) \times (3)$

Thus, HCF of 54 and 81 $= 3 \times 3 \times 3 = 27$

Thus, the gardner prepared 27 flowers. Therefore, each flower bouquet contains 2 roses and 3 marigold flowers.

1. Find HCF by finding factors :

(1) 6 and 8 (2) 16 and 56 (3) 24, 60 and 84 (4) 75, 79 and 89

2. Find HCF by using prime factor method :

(1) 25 and 55 (2) 66 and 88 (3) 54, 81 and 99 (4) 45,65 and 80

3. Manukaka distribute 96 marbles among the children of a class in such a way that each child got equal number of marble. In the same class, sameway he also distributed 72 chocolates. No chocolate and marble is left. How many maximum students are there in this class so that it is possible ?

Exercise

1. Fill in the blanks to make the statement correct :

(1) The greatest common factor of given numbers is called _____ .

(2) The smallest common multiple of given numbers is called _____ .

(3) LCM of two or more prime numbers is equals to its _____ .

(4) HCF of two or more prime numbers is equals to its _____ .

(5) For any numbers the smallest common factor is _____ .

2. Find LCM :

(1) 18 and 27 (2) 30 and 45 (3) 13, 26 and 39 (4) 20, 40 and 50

3. Find HCF :

(1) 5, 13 (2) 15, 24 (3) 15, 25 and 35 (4) 12, 18 and 24

❖ **Think :**

- What is the HCF of two consecutive numbers ?
- What is the LCM of two consecutive numbers ?
- What is the HCF of two odd consecutive numbers ?
- What is the LCM of two odd consecutive numbers ?
- Take a book from your school library showing the different methods and uses of LCM and HCF, also collect the information to find HCF by division method. Also calculate some problem sums about LCM and HCF

❖ **In the following square, fill up the yellow colour in the box which shows the number of multiple of 3 and see, which shape is formed ? Also, fill up the red colour in the box of multiple of 7 and see, which shape is formed ?**

37	16	38	3	17	55	41
4	2	9	13	15	29	5
52	27	1	5	4	33	32
39	21	63	105	84	42	45
59	56	8	10	13	14	26
31	70	44	11	22	28	34
43	35	91	7	77	49	23

- Note down the numbers which are multiple of both 3 and 7.

Answers

Practice 1

1. (1) 30 (2) 18 (3) 72 (4) 30 **2.** (1) 60 (2) 120 (3) 45 (4) 66 **3.** 30

Practice 2

1. (1) 2 (2) 8 (3) 12 (4) 1 **2.** (1) 5 (2) 22 (3) 9 (4) 5 **3.** 24

Exercise

1. (1) HCF (2) LCM (3) Multiplication (4) 1 (5) 1

2. (1) 54 (2) 90 (3) 78 (4) 200 **3.** (1) 1 (2) 3 (3) 5 (4) 6

◆

Fun with Maths

- **Method to find HCF and LCM together :**

Let us find HCF and LCM of 16 and 24 :

- **HCF - Highest Common Factor :**

Draw the circle on the number which divides the given numbers and left no remainder.

Product of those numbers,

e.g. $2 \times 2 \times 2 = 8$ shows HCF

- **LCM - Lowest Common Multiple :**

Product of each prime numbers shown on left side shows LCM

e.g. $2 \times 2 \times 2 \times 2 \times 3 = 48$ is LCM

(2)	16	24
(2)	8	12
(2)	4	6
2	2	3
3	1	3
	1	1

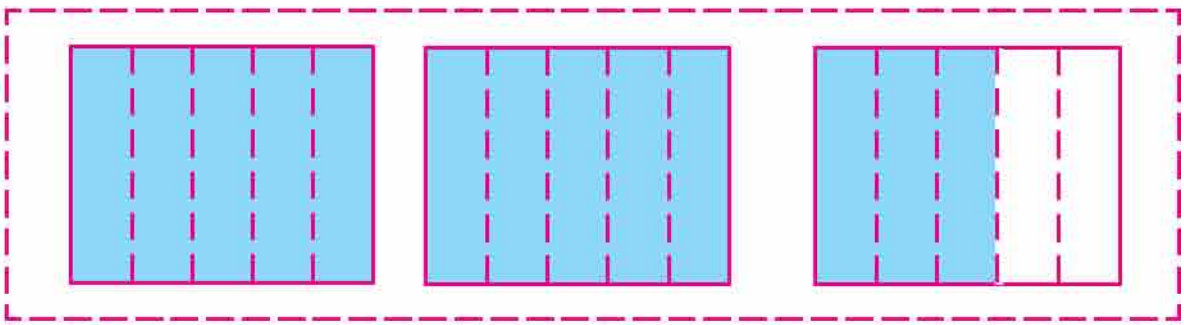
4 Fraction

- **Let us remember :**

Activity 1 : Take a separate sheet of paper and prepare boxes by using the mix integer given below. Also fill up with colours :

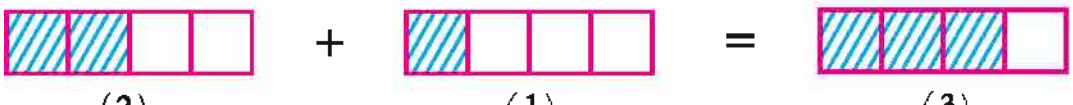
$1\frac{1}{3}$, $1\frac{2}{7}$, $2\frac{4}{5}$, $2\frac{3}{5}$

e.g. $2\frac{3}{5}$

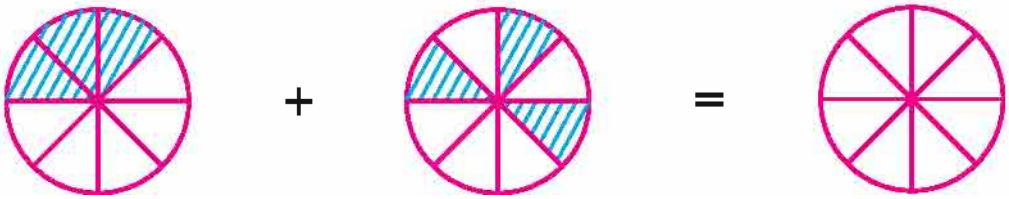


$= 2\frac{3}{5}$

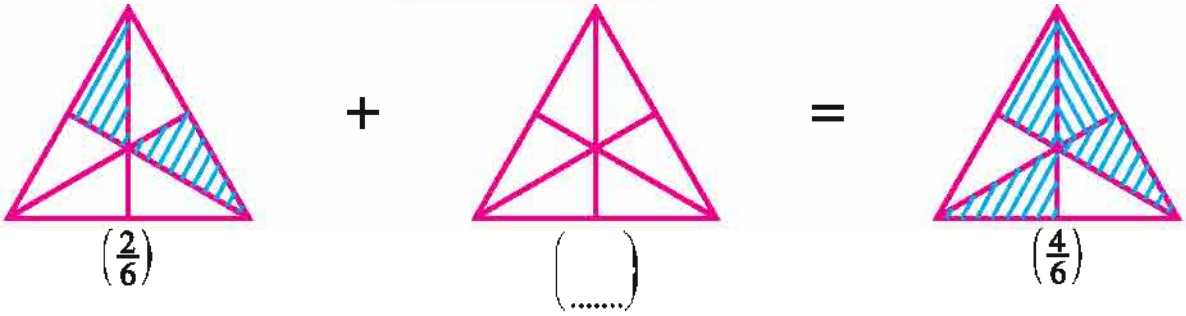
Activity 2 : According to the given sample (1), new fraction is formed by addition-substraction of given fractions. Fill up the colours in boxes of new correct fraction and also write the correct fraction.

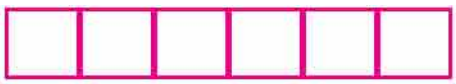
(1)  $\left(\frac{2}{4}\right) + \left(\frac{1}{4}\right) = \left(\frac{3}{4}\right)$

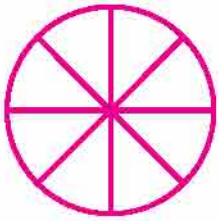
(2)  $\left(\frac{3}{5}\right) + \left(\frac{2}{5}\right) = \left(\quad\right)$

(3)  $\left(\frac{3}{8}\right) + \left(\frac{3}{8}\right) = \left(\quad\right)$

(4)



(5) $\frac{5}{6} - \frac{2}{6}$ =  = $\frac{3}{6}$

(6) $\frac{7}{8} - \frac{2}{8}$ =  = $\frac{5}{8}$

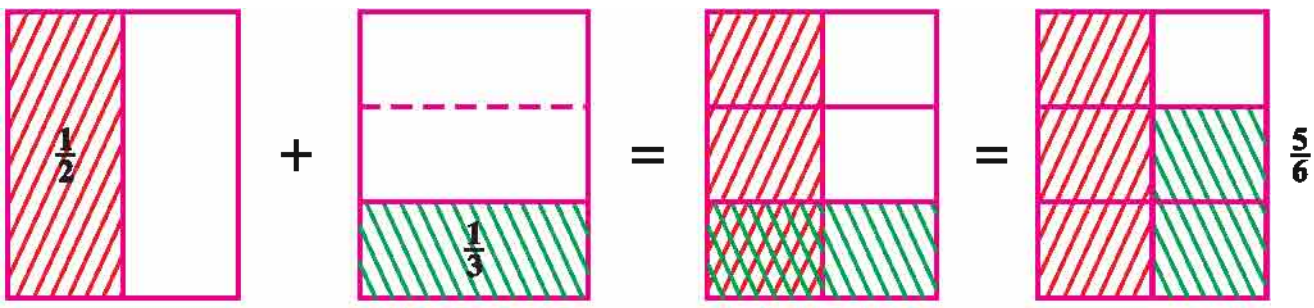
- **Let's learn new :**
  - **Addition of unlike fractions :**

Try to understand the addition of unlike fractions with an example.

Illustration 1 : $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$

Solution :

Understand the addition of $\frac{1}{2}$ and $\frac{1}{3}$ through figure.



(a) (b) (c) (d)

In fig. (a) pink lines part shows $\frac{1}{2}$.

In fig. (b) blue lines part shows $\frac{1}{3}$.

By adding fig. (a) and (b), fig. (c) is formed. Out of total six parts of figure, in one part pink and blue lines meet with each other.

If we place the blue lines part into a blank part then fig. (d) is obtained. It shows the addition of $\frac{1}{2}$ and $\frac{1}{3}$, which is equal to $\frac{5}{6}$.

Thus, $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$ (Here, denominator of $\frac{5}{6}$ i.e. 6 is the LCM of denominator of $\frac{1}{2}$ and denominator of $\frac{1}{3}$.)

Here, addition is also possible by making the denominator 6 of $\frac{1}{2}$ and $\frac{1}{3}$.

$$\frac{1}{2} = \frac{1 \times 3}{2 \times 3} = \frac{3}{6}$$

$$\frac{1}{3} = \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$$

$$\therefore \quad \frac{3}{6} + \frac{2}{6} = \frac{3+2}{6} = \frac{5}{6}$$

It is little difficult and tidious to make addition of unlike fractions through figures. But by finding LCM of denominator and converting it into like fraction, it will be easy !!

Let us understand by the illustration :

Illustration 2 : $\frac{1}{6} + \frac{1}{4}$

Solution : Here, denominator of both the fractions are different. So, add them by converting into like fraction.

For this, find LCM of 6 and 4.

LCM of 6 and 4 is 12.

So, make the denominator of $\frac{1}{6}$ and $\frac{1}{4}$ is 12.

2	6	4
2	3	2
3	3	1
	1	1

LCM = 2 × 2 × 3 = 12

$\frac{1}{6} = \frac{1\times2}{6\times2} = \frac{2}{12}$ (Multiplying numerator and denominator by 2, to make the denominator 12.)

$\frac{1}{4} = \frac{1\times3}{4\times3} = \frac{3}{12}$ (Multiplying numerator and denominator by 3, to make the denominator 12.)

Now, $\frac{2}{12}$ and $\frac{3}{12}$ are like fractions.

$\therefore \quad \frac{2}{12} + \frac{3}{12}$

$= \frac{2+3}{12}$

$= \frac{5}{12}$

$\therefore \quad \frac{1}{6} + \frac{1}{4} = \frac{5}{12}$

Illustration 3 : $\frac{3}{5} + 2 + \frac{1}{4}$

Solution : $\frac{3}{5} + 2 + \frac{1}{4} = \frac{3}{5} + \frac{2}{1} + \frac{1}{4}$

LCM of 5, 1 and 4 is 20.

So, make the denominator of each fraction 20.

$= \frac{3\times4}{5\times4} + \frac{2\times20}{1\times20} + \frac{1\times5}{4\times5}$

$= \frac{12}{20} + \frac{40}{20} + \frac{5}{20}$

$= \frac{12+40+5}{20}$

2	5	1	4
2	5	1	2
5	5	1	1
	1	1	1

LCM = 2 × 2 × 5 = 20

$= \frac{57}{20}$

$= 2\frac{17}{20}$

$\therefore \quad \frac{3}{5} + 2 + \frac{1}{4} = 2\frac{17}{20}$

- When there is an integer in the addition of fractions it means denominator is 1.
- In the calculation of addition of unlike fractions, it is not necessary to show the calculation of LCM.

Practice 1

1. Do addition :

(1) $\frac{3}{4} + \frac{5}{8}$ (2) $\frac{2}{5} + \frac{3}{7}$ (3) $2\frac{3}{4} + 1\frac{2}{3}$

(4) $4\frac{2}{3} + \frac{7}{6} + 4$ (5) $2\frac{5}{8} + \frac{7}{16}$ (6) $\frac{3}{4} + \frac{1}{6} + \frac{5}{12}$

2. Take two numbers from mix fractions box and add it. Find the result on the game--board and make '×' sign on it :

Mix Fractions	
$3\frac{5}{8}$	$2\frac{1}{4}$
$1\frac{3}{8}$	$2\frac{1}{8}$
$1\frac{1}{2}$	$4\frac{3}{4}$
$2\frac{3}{4}$	$1\frac{1}{4}$

Game-Board				
$3\frac{1}{2}$	5	$6\frac{1}{4}$	$4\frac{7}{8}$	$3\frac{5}{8}$
$2\frac{3}{4}$	$3\frac{3}{4}$	$6\frac{3}{8}$	$6\frac{1}{8}$	7
6	$4\frac{1}{4}$		$2\frac{7}{8}$	$2\frac{5}{8}$
$3\frac{3}{8}$	$4\frac{3}{8}$	$5\frac{3}{4}$	4	$6\frac{7}{8}$
$5\frac{7}{8}$	$7\frac{1}{2}$	$8\frac{3}{8}$	$5\frac{1}{8}$	$4\frac{1}{8}$

- **Subtraction of unike fractions :**

Illustration 4 : Subtract : $\frac{3}{4} - \frac{2}{3}$

Solution : Here, denominator of both fractions are different, so convert them into like fractions and then subtract. To convert them into like fractions, find the LCM of denominators 4 and 3.

$$\therefore \quad \frac{3}{4} - \frac{2}{3} = \frac{3\times3}{4\times3} - \frac{2\times4}{3\times4}$$

$$= \frac{9}{12} - \frac{8}{12}$$

$$= \frac{9-8}{12}$$

$$= \frac{1}{12}$$

$$\therefore \quad \frac{3}{4} - \frac{2}{3} = \frac{1}{12}$$

2	4	3
2	2	3
3	1	3
	1	1

LCM = 2 × 2 × 3 = 12

Illustration 5 : Subtract : $6 - 2\frac{3}{5}$

Solution : $6 - 2\frac{3}{5} = \frac{6}{1} - \frac{13}{5}$

$$= \frac{6\times5}{1\times5} - \frac{13}{5} \quad \text{(LCM of 1 and 5 is 5.)}$$

$$= \frac{30}{5} - \frac{13}{5}$$

$$= \frac{30-13}{5}$$

$$= \frac{17}{5} = 3\frac{2}{5}$$

$$\therefore \quad 6 - 2\frac{3}{5} = 3\frac{2}{5}$$

Practice 2

1. Do subtraction :

(1) $3\frac{1}{5} - 2\frac{3}{10}$ (2) $5 - \frac{4}{11}$ (3) $\frac{7}{2} - \frac{6}{13}$

(4) $5\frac{13}{20} - 4\frac{3}{10}$ (5) $7 - 3\frac{5}{9}$ (6) $7\frac{1}{2} - 2\frac{3}{4}$

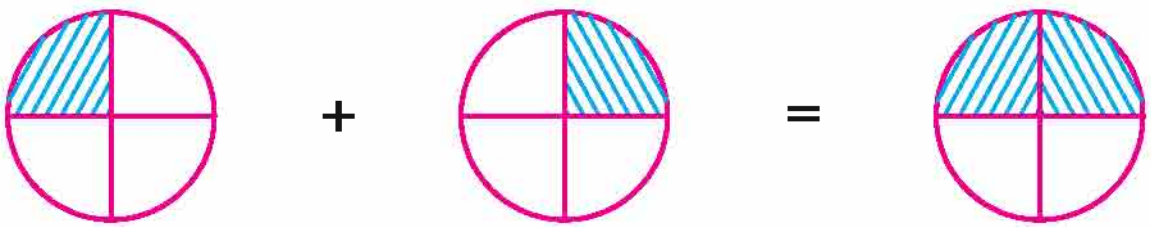
2. Fill in the blank, with appropriate answer by doing addition and subtraction :

	+		
−	$\frac{2}{8}$	$\frac{4}{8}$	____
	$\frac{1}{8}$	$\frac{2}{8}$	____
	____	____	____

	+		
−	$\frac{1}{2}$	$\frac{1}{3}$	____
	$\frac{1}{3}$	$\frac{1}{4}$	____
	____	____	____

- **Product of fraction with integer :**

Let us understand the product of fraction with integer by following figures :



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

Here, $\frac{1}{4}$ is shown two times through figure.

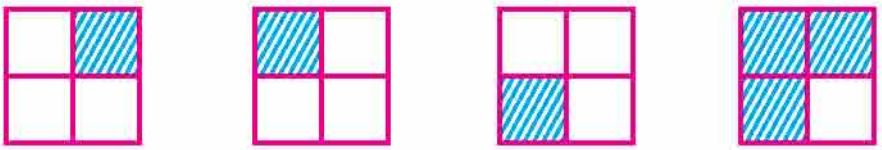
By addition of them, $\frac{1}{4} + \frac{1}{4} = \frac{1+1}{4} = \frac{2}{4}$ is obtained.

Thus, by taking $\frac{1}{4}$ two times $\frac{2}{4}$ is obtained, it means $\frac{1}{4}$ is multiplied by 2.

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

See the following figures and fill in the blanks :

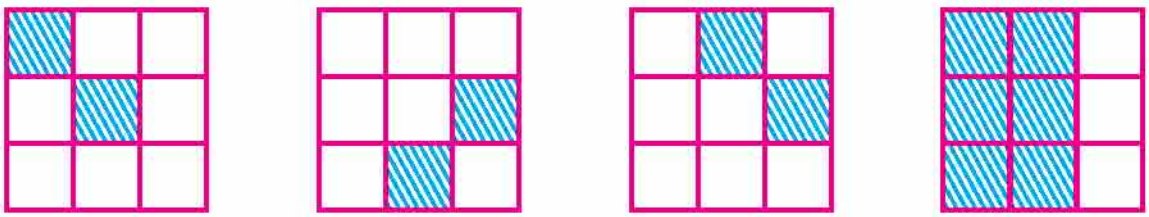
1.



_____ + _____ + _____ = _____

i.e. $\frac{1}{4} \times 3 = \frac{1}{4} \times \frac{3}{1} = \frac{3 \times 1}{4 \times 1} = \frac{3}{4}$

2.



_____ + _____ + _____ = _____

i.e. $\frac{2}{9} \times 3$

$= \frac{2}{9} \times \frac{3}{1} = \frac{2 \times 3}{9 \times 1} = \frac{6}{9} = \frac{2}{3}$ (Reduced form)

3. $3 \times \frac{2}{5}$ = _____

4. $4 \times \frac{3}{7}$ = _____

5. $3 \times \frac{5}{8}$ = _____

- **Product of fraction with fraction :**

(a) (b) (c)

(1) Coloured part of fig. (a) is _____ part of whole figure.

(2) Coloured part of fig. (b) is _____ part of whole figure.

Fig. (a) and (b) when coincide fig. (c) is formed.

(3) In fig. (c) _____ parts are seen.

(4) Pink and blue coloured lining part is _____ part of fig. (c), which shows the product of $\frac{1}{3}$ and $\frac{2}{4}$.

This product is also written as under :

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

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

$$= \frac{2}{12} = \frac{1}{6} \text{ (Reduced form)}$$

In same way,

- $\frac{3}{5} \times \frac{2}{4} = \frac{3 \times 2}{5 \times 4} = \frac{6}{20} = \frac{3}{10}$ (Reduced form)
- $\frac{1}{3} \times \frac{4}{7} = \frac{1 \times 4}{3 \times 7} = \frac{4}{21}$

Product of fractions $= \frac{\text{Product of numerators of fractions.}}{\text{Product of denomenators of fractions.}}$

- **Reciprocal of integer and fraction :**

Do multiplication :

(1) $2 \times \frac{1}{2} = 1$

(2) $5 \times \frac{1}{5} =$ _____

(3) $7 \times \frac{1}{7} =$ _____

(4) $\frac{22}{3} \times \frac{3}{22} =$ _____

(5) $\frac{13}{8} \times \frac{8}{13} =$ _____

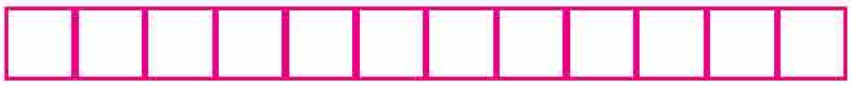
(6) Result of the product of above questions is _____ .

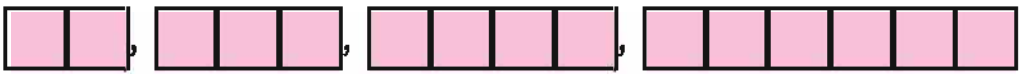
Thus, **"If the product of two numbers is 1, then those numbers are called reciprocal to each other."**

- Reciprocal of 3 is $\frac{1}{3}$ and reciprocal of $\frac{1}{3}$ is 3.
- Reciprocal of 7 is $\frac{1}{7}$ and reciprocal of $\frac{1}{7}$ is 7.
- Reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$ and reciprocal of $\frac{3}{2}$ is $\frac{2}{3}$.

Zero has no reciprocal. (Because product of zero with any number is zero, not 1.)

- **Division of fraction with natural number :**



Cut  from above.

Now, one by one arrange every shape on the above rectangle and check it how many pieces are necessary to cover the rectangle ? Now, fill up the following table :

No.	Division by natural number	Multiplication by reciprocal of that number
(1)	$12 \div 2 =$ _____	$12 \times \frac{1}{2} =$ _____
(2)	$12 \div 3 =$ _____	$12 \times \frac{1}{3} =$ _____
(3)	$12 \div 4 =$ _____	$12 \times \frac{1}{4} =$ _____
(4)	$12 \div 6 =$ _____	$12 \times \frac{1}{6} =$ _____

Which result is obtained by doing both procedure ? _____

Therefore,

A number is divided by any number except zero means multiplication of reciprocal of that number.

Similarly,

To divide given fraction with natural number, multiply the fraction with reciprocal of that natural number.

Like,

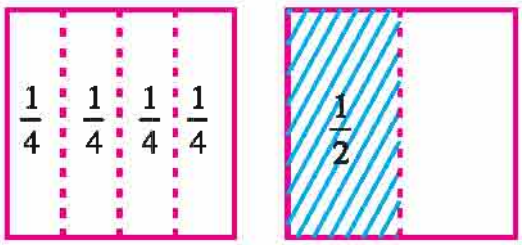
- $\frac{1}{5} \div 2 = \frac{1}{5} \times \frac{1}{2} = \frac{1 \times 1}{5 \times 2} = \frac{1}{10}$

- $\frac{2}{3} \div 4 = \frac{2}{3} \times$ _____ = _____ = _____
- $\frac{3}{8} \div 9 = \frac{3}{8} \times$ _____ = _____ = _____

- **Division of fraction with fraction :**

Activity :

- Take a paper and fold from middle. Now, again fold it. When you open the paper then according to fig. (a), it is divided into four parts. Cut all these four parts.
- Take another paper and fold from middle. Open the paper, then according to fig. (b), it is dividied into two parts.
- Now, cover the parts of second paper with the four parts of first paper.



(a) (b)

Now, how many pieces of $\frac{1}{4}$ parts are used to cover the piece of $\frac{1}{2}$ part ?

Thus, $\frac{1}{2} \div \frac{1}{4}$

$= \frac{1}{2} \times \frac{4}{1}$ (Divide $\frac{1}{2}$ by $\frac{1}{4}$ means, multiply by the reciprocal of $\frac{1}{4}$)

$= 2$

Illustration 6 : $\frac{1}{2} \div \frac{1}{3}$

Solution : $= \frac{1}{2} \times \frac{3}{1}$

$= \frac{3}{2} = 1\frac{1}{2}$

$\therefore \frac{1}{2} \div \frac{3}{2} = \frac{3}{2} = 1\frac{1}{2}$

Illustration 7 : $\frac{3}{7} \div 1\frac{2}{3}$

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

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

$= \frac{9}{35}$

$\therefore \quad \frac{3}{7} \div 1\frac{2}{3} = \frac{9}{35}$

Illustration 8 : $3\frac{4}{7} \div 1\frac{5}{7}$

Solution : $3\frac{4}{7} \div 1\frac{5}{7} = \frac{25}{7} \div \frac{12}{7}$

$= \frac{25}{7} \times \frac{7}{12}$

$= \frac{25}{12}$

$= 2\frac{1}{12}$

$\therefore \quad 3\frac{4}{7} \div 1\frac{5}{7} = 2\frac{1}{12}$

Practice 4

1. Divide the following :

(1) $18 \div 6$

(2) $\frac{6}{7} \div 3$

(3) $\frac{5}{7} \div \frac{5}{14}$

(4) $\frac{3}{5} \div \frac{2}{3}$

(5) $\frac{7}{8} \div 1\frac{1}{4}$

(6) $2\frac{1}{5} \div \frac{22}{5}$

(7) $3\frac{1}{5} \div \frac{6}{8}$

(8) $2\frac{1}{6} \div 3\frac{5}{7}$

- **Think :**
  - $\frac{1}{4}$ part of a day means how many hours ?
  - Aahna has 15 books. Out of these $\frac{2}{5}$ parts of the books are of mathematical problems. Then find the number of books of mathematical problems.

- **Simplification of four operations in fraction :**

We have learnt simplification of four operations for integers. In the same way, to simplify four operations in fraction, first do division then multiplication and then do addition and subtraction. Let us understand the simplification.

Illustration 9 : $\frac{4}{5} + \frac{2}{3} \div 1\frac{2}{3} \times \frac{6}{5}$

Solution : $\frac{4}{5} + \frac{2}{3} \div 1\frac{2}{3} \times \frac{6}{5}$

$= \frac{4}{5} + \frac{2}{3} \div \frac{5}{3} \times \frac{6}{5}$ (Converting mix fraction into fraction.)

$= \frac{4}{5} + \left(\frac{2}{3} \div \frac{5}{3}\right) \times \frac{6}{5}$

$= \frac{4}{5} + \frac{2}{3} \times \frac{3}{5} \times \frac{6}{5}$ (Division means multiplication of reciprocal.)

$= \frac{4}{5} + \frac{2}{3} \times \frac{3}{5} \times \frac{6}{5}$ (by multiplying)

$= \frac{4}{5} + \frac{2 \times 6}{5 \times 5}$ (Simplification of product)

$= \frac{4}{5} + \frac{12}{25}$ (Simplification of product)

$= \frac{4 \times 5}{5 \times 5} + \frac{12}{25}$ (Converting into like fraction by taking LCM)

$= \frac{20}{25} + \frac{12}{25}$ (Converting fraction into like fraction.)

$= \frac{20 + 12}{25}$ (by adding)

$= \frac{32}{25} = 1\frac{7}{25}$ (Converting into mix fraction.)

Illustration 10 : $\frac{3}{5} + \frac{1}{4} \times \frac{2}{5}$

Solution : $\frac{3}{5} + \frac{1}{4} \times \frac{2}{5}$

$= \frac{3}{5} + \frac{1 \times 2}{4 \times 5}$

$= \frac{3}{5} + \frac{2}{20}$

$= \frac{3 \times 4}{5 \times 4} + \frac{2}{20}$

2	5	20
2	5	10
5	5	5
	1	1

LCM = 2 × 2 × 5 = 20

$$= \frac{12}{20} + \frac{2}{20}$$

$$= \frac{12+2}{20}$$

$$= \frac{14}{20} = \frac{2 \times 7}{2 \times 10} = \frac{7}{10}$$

$$\therefore \quad \frac{3}{5} + \frac{1}{4} \times \frac{2}{5} = \frac{7}{10}$$

Illustration 11 : $\frac{7}{9} \div \frac{3}{5} + \frac{2}{3}$

Solution : $\frac{7}{9} \div \frac{3}{5} + \frac{2}{3}$

$$= \frac{7}{9} \div \frac{3}{5} + \frac{2}{3}$$

$$= \frac{7}{9} \times \frac{5}{3} + \frac{2}{3}$$

$$= \frac{7 \times 5}{9 \times 3} + \frac{2}{3}$$

$$= \frac{35}{27} + \frac{2}{3}$$

$$= \frac{35}{27} + \frac{2 \times 9}{3 \times 9}$$ (LCM of 27 and 3 is 27, so, making denominator 27.)

$$= \frac{35}{27} + \frac{18}{27}$$

$$= \frac{35+18}{27} = \frac{53}{27} = 1\frac{26}{27}$$

$$\therefore \quad \frac{7}{9} \div \frac{3}{5} \times \frac{2}{3} = 1\frac{26}{27}$$

Illustration 12 : $\frac{4}{6} + 1\frac{2}{3} \times \frac{3}{10} - \frac{1}{3}$

Solution : $\frac{4}{6} + 1\frac{2}{3} \times \frac{3}{10} - \frac{1}{3}$

$= \frac{4}{6} + \frac{5}{3} \times \frac{3}{10} - \frac{1}{3}$

$= \frac{4}{6} + \frac{\cancel{5}}{\cancel{3}} \times \frac{\cancel{3}}{\cancel{10}_{2}} - \frac{1}{3}$

$= \frac{4}{6} + \frac{1}{2} - \frac{1}{3}$

$= \frac{4}{6} + \frac{1\times3}{2\times3} - \frac{1\times2}{3\times2}$ (LCM of 2 and 3 is 6, so making denominator 6.)

$= \frac{4}{6} + \frac{3}{6} - \frac{2}{6}$

$= \frac{4+3-2}{6}$

$= \frac{5}{6}$

$\therefore \frac{4}{6} + 1\frac{2}{3} \times \frac{3}{10} - \frac{1}{3} = \frac{5}{6}$

- **While simplifying four operations in fraction...**
  - If in the question, mix fraction is given then first convert it into fraction.
  - Out of multiplication and division, in the given question, which one comes first from left side, simplify it first.
  - Keep in mind that division means multiplication with reciprocal.
  - At last convert the fraction into like fraction and then do other operations.
  - If answer is in improper fraction then convert it into mix fraction.

Practice 5

❖ **Simplify the following :**

(1) $3\frac{2}{5} + 1\frac{3}{6} \times \frac{15}{9}$ (2) $\frac{9}{12} - \frac{18}{24} \times \frac{7}{24} + \frac{2}{6}$

(3) $5\frac{2}{8} \div \frac{2}{14} + \frac{5}{7}$ (4) $4\frac{2}{3} - 9\frac{3}{5} \div 2\frac{2}{15}$

(5) $\frac{6}{7} \times 2\frac{4}{5} - \frac{2}{11} \times 8\frac{1}{4}$ (6) $\frac{9}{3} \div \frac{4}{6} \times \frac{13}{18} - \frac{3}{5}$

Exercise

1. Add the following :

(1) $\frac{3}{5} + \frac{2}{4}$ (2) $\frac{4}{7} + 6$ (3) $\frac{3}{8} + 1\frac{2}{4}$ (4) $2\frac{1}{5} + 3\frac{3}{5} + 2\frac{1}{3}$

2. Subtract the following :

(1) $\frac{6}{9} - \frac{3}{18}$ (2) $8 - 3\frac{5}{9}$ (3) $4 - \frac{5}{11}$ (4) $8\frac{1}{2} - 5\frac{7}{8}$

3. Multiply the following :

(1) $\frac{6}{15} \times \frac{5}{18}$ (2) $\frac{3}{8} \times \frac{16}{21}$ (3) $\frac{9}{10} \times \frac{5}{7} \times \frac{14}{25}$ (4) $8 \times \frac{3}{19} \times \frac{38}{56}$

4. Divide the following :

(1) $\frac{18}{81} \div \frac{36}{45}$ (2) $4\frac{1}{5} \div \frac{42}{50}$ (3) $9\frac{2}{7} \div 4\frac{1}{3}$ (4) $\frac{72}{7} \div 2\frac{18}{21}$

5. Simplify :

(1) $\frac{17}{13} \times \frac{13}{17} - \frac{1}{5}$ (2) $\frac{2}{5} + \frac{6}{10} \div \frac{24}{15}$

(3) $\frac{9}{4} \times 3\frac{4}{5} \div 5\frac{2}{11}$ (4) $\frac{16}{9} \div \frac{48}{45} - \frac{2}{7}$

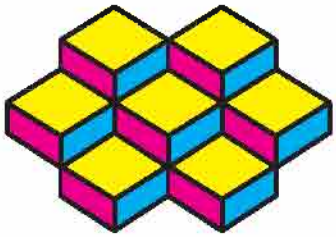


Figure 1

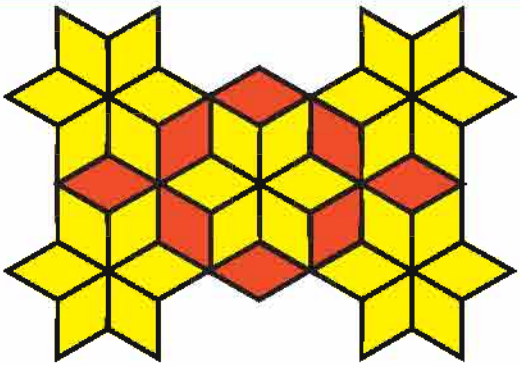


Figure 2

No. of fig.	Shape	In fraction form	Make a pair of unlike fraction, from given fraction in adjoining table.
(1)		$\frac{7}{21}$	(1)
			(2)
			(3)
(2)			(4)
			

In the pair-1 of unlike fraction apply addition, in pair-2 apply subtraction, in pair-3 apply multiplication and in pair-4 apply division and obtain the result.

Answers

Practice 1

1. (1) $1\frac{3}{8}$ (2) $\frac{29}{35}$ (3) $4\frac{5}{12}$ (4) $9\frac{5}{6}$ (5) $3\frac{1}{16}$ (6) $1\frac{1}{3}$

Practice 2

1. (1) $\frac{9}{10}$ (2) $4\frac{7}{11}$ (3) $3\frac{1}{26}$ (4) $1\frac{7}{20}$ (5) $3\frac{4}{9}$ (6) $4\frac{3}{4}$

2.

− \ +	+	+
−	$\frac{2}{8}$	$\frac{4}{8}$	$\frac{6}{8}$
−	$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$
−	$\frac{1}{8}$	$\frac{2}{8}$	$\frac{3}{8}$

− \ +	+	+
−	$\frac{1}{2}$	$\frac{1}{3}$	$\frac{5}{6}$
−	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{7}{12}$
−	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{3}{12}$

Practice 3

(3) $1\frac{1}{5}$ (4) $1\frac{5}{7}$ (5) $1\frac{7}{8}$

Practice 4

(1) 3 (2) $\frac{2}{7}$ (3) 2 (4) $\frac{9}{10}$ (5) $\frac{7}{12}$

(6) $\frac{1}{2}$ (7) $4\frac{4}{15}$ (8) $\frac{7}{10}$

Practice 5

(1) $5\frac{9}{10}$ (2) $\frac{83}{96}$ (3) $1\frac{13}{28}$ (4) $\frac{1}{6}$ (5) $\frac{9}{10}$ (6) $2\frac{13}{20}$

Exercise

[1] (1) $1\frac{1}{10}$ (2) $6\frac{4}{7}$ (3) $1\frac{7}{8}$ (4) $8\frac{2}{15}$

[2] (1) $\frac{1}{2}$ (2) $4\frac{4}{9}$ (3) $3\frac{6}{11}$ (4) $2\frac{5}{8}$

[3] (1) $\frac{1}{9}$ (2) $\frac{2}{7}$ (3) $\frac{9}{25}$ (4) $\frac{6}{7}$

[4] (1) $\frac{5}{18}$ (2) 5 (3) $2\frac{1}{7}$ (4) $3\frac{3}{5}$

[5] (1) $\frac{4}{5}$ (2) $\frac{31}{40}$ (3) $1\frac{13}{20}$ (4) $1\frac{8}{21}$

1 Revision

1. Fill in the blanks by selecting proper alternative :

(1) 3 – (–3) = ?

(A) 0 (B) –6 (C) 6 (D) 3

(2) (–5) + 6 = ?

(A) (–1) (B) 1 (C) 11 (D) (–11)

(3) What is the measure of complementary angle of 32° ?

(A) 68° (B) 78° (C) 58° (D) 68°

(4) What is the measure of supplementary angle of 32° ?

(A) 58° (B) 148° (C) 138° (D) 78°

(5) Measure of an angle of linear pair is 125°, then what is the measure of another angle ?

(A) 55° (B) 75° (C) 65° (D) 45°

(6) What is the HCF of 13 and 22 ?

(A) 13 (B) 22 (C) 1 (D) 286

(7) What is the LCM of 14 and 42 ?

(A) 7 (B) 14 (C) 1 (D) 42

2. With the help of numberline write the integers lying between :

(1) (–4) to 2 (2) (–1) to 6

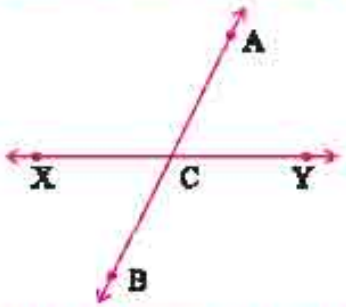
3. Arrange the following in ascending and descending order with the help of numberline :

(1) 2, (–3), 4 (–5) (2) (–2), 0, 3, (–5)

4. $\overleftrightarrow{MG}$ and $\overleftrightarrow{JN}$ intersects each other at point O. Measure of one angle formed by intersection is 120°, then find the measure of another three angles.

5. Find the result with the help of numberline : (1) 6 + (–2) (2) (–6) – 5

6. **Answer the following from given figure :**

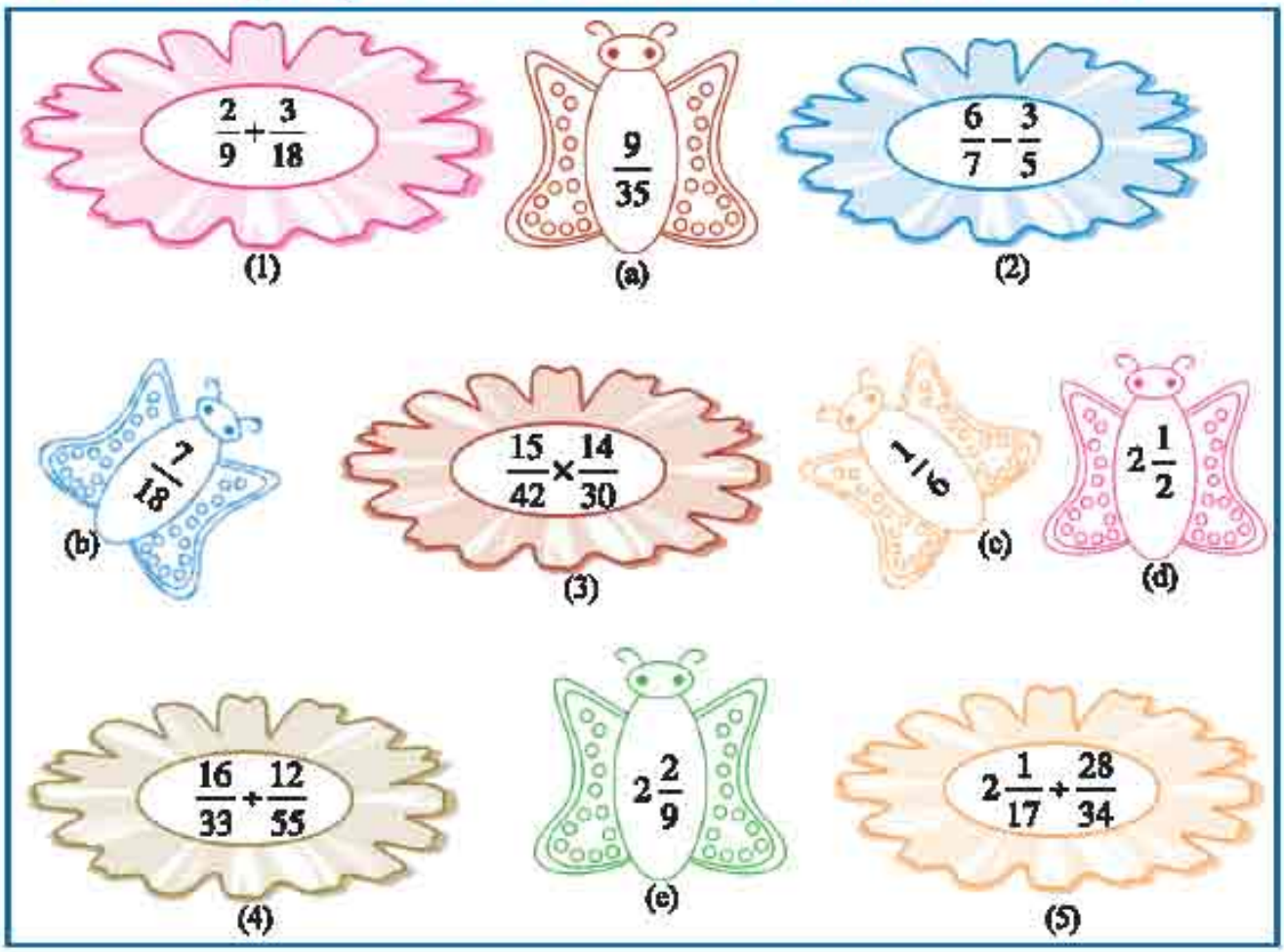


(1) How many pair of vertically opposite angles are formed ?

(2) Write the pair of vertically opposite angles.

(3) How many pair of angles of linear pair are formed ? Which ?

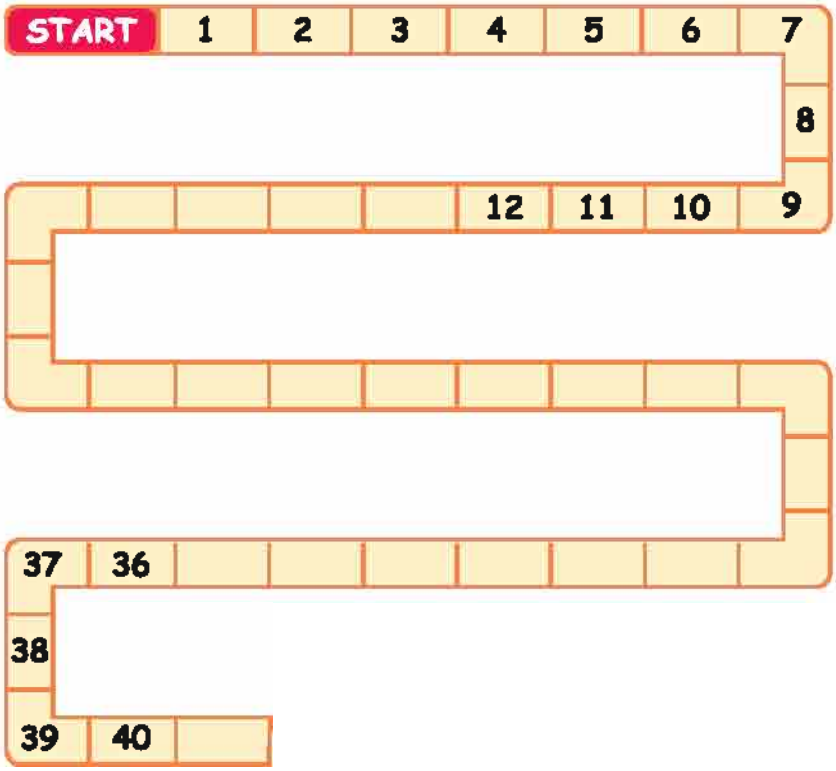
7. **Which butterfly is placed on which flower ? Calculate and decide :**



On flower (1) ....., on (2) ....., on (3) ....., on (4) ..... and on (5) ..... butterflies are sat.

- **Play the game : (Read instructions and move.)**

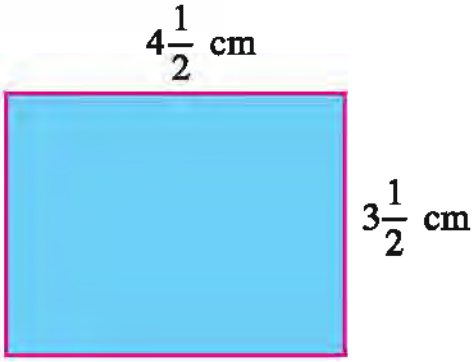
[Monkey, Frog, Butterfly, Grasshoper]



- Write missing numbers.
- Grasshoper jumps every second box and moves on.
- Butterfly jumps every third box and moves on.
- Frog jumps every fourth box and moves on.
- Monkey jumps every sixth box and moves on.

Upto 100, from which boxes all the four jump and move ? Find it.

8. Find perimeter and area formed by the length and breadth of the given rectangle :



Answers

1. (1) C (2) B (3) C (4) B (5) A (6) C (7) D

2. (1) (–3), (–2), (–1), 0, 1 (2) 0, 1, 2, 3, 4, 5

3. (1) Ascending order : (–5), (–3), 2, 4 (2) Ascending order : (–5), (–2), 0, 3

(1) Descending order : 4, 2, (–3), (–5) (2) Descending order : 3, 0, (–2), (–5)

4. 60°, 120°, 60° **5.** (1) 4 (2) (–11)

6. (1) Two pairs

(2) ∠ACY and ∠ XCB, ∠ACX and ∠BCY

(3) Four pairs

(1) ∠ ACY and ∠BCY (2) ∠BCY and ∠BCX

(3) ∠BCX and ∠ACX (4) ∠ACX and ∠ACY

8. Perimeter = 16 cm, Area = $\frac{63}{4}$ sq cm or $15\frac{3}{4}$ sq cm

◆

π = Pi

In geometry π is used as a constant, basically it is 16th greek alphabet. In 1700 AD mathematician of England showed the Pi as U-pin manner. In late 1859 Proof. Benjamin Pears gave the new version of the symbol of Pi. For the first time, greek mathematician Ptolemy gave the value of π i.e. 3.1416. Up to 1600 AD world's mathematicians consider this value of π. But, after the invension of decimal system, it is clear that value of π is infinite.

5 Decimal Fraction

- **Aashna bought three pens, from the market, at the cost of rupees 5 for 1 pen. While Akshat bought three pens at the cost of ₹ 5.50 for 1 pen. Say, how much rupees Aashma and Akshat spent ?**

Aashna	Akshat
5 + 5 + 5 = _____	5.50 + 5.50 + 5.50 = _____
or	or
5 × 3 = _____	5.50 × 3 = _____ ? (Now, what to do?)

Let us, start the calculation.

Step-1	Step-2
5.50	5.50 (2 Decimal Place)
× 3	× 3 (0 Decimal Place)
1650	16.50 (2 + 0 = 2 Decimal Place)
(Neglecting decimal point)	(By adding decimal Point)

Answer : Aashna spent Rs. 15 and Akshat spent ₹ 16.50.

- **Now, let us find the rupees spent by Akshat by fraction.**

$$5.50 = \frac{550}{100}$$

$$5.50 \times 3 = \frac{550}{100} \times 3 = \frac{1650}{100} = 16.50$$

∴ Answer : ₹ 16.50

❖ Product of decimal fraction with integer :

Illustration 1 : 3.75 × 5

Solution :

$$\begin{array}{r} 3.75 \text{ (2 decimal place)} \\ \times \quad 5 \text{ (0 decimal place)} \\ \hline 18.75 \text{ (2 + 0 = 2 decimal place)} \end{array}$$

∴ 3.75 × 5 = 18.75

Illustration 2 : 0.025 × 13

Solution :

$$\begin{array}{r} 0.025 \text{ (3 decimal place)} \\ \times \quad 13 \text{ (0 decimal place)} \\ \hline 250 \\ + \ 75 \\ \hline 0.325 \text{ (3 decimal place)} \end{array}$$

∴ 0.025 × 13 = 0.325

Illustration 3 : 3.073 × 12

Solution :

$$\begin{array}{r} 3.073 \\ \times \quad 12 \\ \hline 30.730 \\ + 6.146 \\ \hline 36.876 \end{array}$$

∴ 3.073 × 12 = 36.876

- We have learnt that any number is multiplied by zero, the product is zero.

E.g, 6 × 0 = 0, 125 × 0 = 0

Same way, if decimal fraction is multiplied by zero, the product is zero.

E.g, 3.4 × 0 = 0

6.70 × 0 = 0

0 × 5.24 = 0

❖ Product of decimal fraction with decimal fraction :

We have seen the product of decimal fraction with integer. Similarly, decimal fraction is multiplied with decimal fraction, let us see some more illustrations.

Illustration 4 : 3.47 × 0.4

Solution :

	3.47	(2 Decimal place)
×	0.4	(1 Decimal place)
	1.388	(3 Decimal place)

∴ 3.47 × 0.4 = 1.388

Illustration 5 : 2.6 × 1.4

Solution :

	2.6	(1 Decimal place)
×	1.4	(1 Decimal place)
	260	
+	104	
	3.64	(2 Decimal place)

∴ 2.6 × 1.4 = 3.64

Illustration 6 : 2.36 × 11.4

Solution :

	2.36
×	11.4
	23600
+	2360
+	944
	26.904

∴ 2.36 × 11.4 = 26.904

Multiplication of decimal fraction is done by neglecting decimal. Then, in the product, total decimal place are placed from left to the unit place.

1. Multiply the following :

(1) 2.25 × 4

(2) 0.035 × 12

(3) 4.203 × 15

(4) 7.604 × 0

(5) 3.5 × 2.4

(6) 6.54 × 0.5

(7) 3.24 × 12.3

(8) 24.7 × 5.9

2. Find mistake and sign with '✓' or '✗' :

45 × 2.2 900 + 90 99.0	4.5 × 2.2 900 + 90 9.90	0.24 × 0.2 0.048	02.4 × 0.2 0.48

❖ Multiplication of decimal fraction with 10, 100 and 1000.

That you know very well.

3 × 10 = _____, 3 × 100 = _____, 3 × 1000 = _____.

Let us multiply decimal fraction with 10, 100 and 1000.

See and understand :

Decimal fraction	Multiply by 10	Multiply by 100	Multiply by 1000
3.45	$\frac{345}{100}\times10$ $=\frac{345}{10}=34.5$	$\frac{345}{100}\times100$ $= 345$	$\frac{345}{100}\times1000$ $= 345 \times 10 = 3450$
0.025	$\frac{25}{1000}\times10$ $=\frac{25}{100}=0.25$	$\frac{25}{1000}\times100$ $=\frac{25}{10}=2.5$	$\frac{25}{1000}\times1000$ $= 25$
32.325	$\frac{32325}{1000}\times10$ $=\frac{32325}{100}=323.25$	$\frac{32325}{1000}\times100$ $=\frac{32325}{10}=3232.5$	$\frac{32325}{1000}\times1000$ $= 32325$

Let us see other illustrations :

$3.456 \times 10 = 34.56$

$3.456 \times 100 = 345.6$

$3.456 \times 1000 = 3456$

From the above illustrations, we conclude that...

- Multiplying decimal fraction by 10, decimal sign moves one decimal place right side.
- Multiplying decimal fraction by 100, decimal sign moves two decimal place right side.
- Multiplying decimal fraction by 1000, decimal sign moves three decimal place right side.

1. Fill in the blanks :

(1) $3.4 \times 10 =$ _____ (2) $0.5 \times 10 =$ _____

(3) $0.46 \times 100 =$ _____ (4) $2.97 \times 10 =$ _____

(5) $0.25 \times 1000 =$ _____ (6) $3.4 \times 1000 =$ _____

(7) $2.1 \times 100 =$ _____ (8) $2.24 \times 100 =$ _____

- **Division of decimal fraction by whole number :**

Asif has 525 marbles. He distributed these marbles to his five friends equally. Then say how many marbles will be received by each friend ?

$525 \div 5 =$ _____

You know this division, but if figure is $5.25 \div 5$ then ?

So, let us do the calculation.

Solution :

Step-1

$$5\overline{)5.25}$$

(Place the decimal-sign, in quotient, exactly above the decimal-sign of dividend)

Step-2

$$5\overline{)5.25}\quad 1.$$
$$-5$$
$$02$$

(Divide the integer if it is possible.)

Step-3

$$5\overline{)5.25}\quad 1.05$$
$$-5$$
$$025$$
$$25$$
$$00$$

(Neglect decimal-sign during calculation)

$\therefore$ $5.25 \div 5 = 1.05$

Illustration 7 : $1.33 \div 7$

Solution :

Step-1

$$7\overline{)1.33}$$

(Place the decimal-sign in quotient, exactly above the decimal-sign of dividend)

Step-2

$$7\overline{)1.33}\quad 0.$$

(Integer is not divisible, so place zero before decimal-sign (left side).

Step-3

$$7\overline{)1.33}\quad 0.19$$
$$-7$$
$$63$$
$$63$$
$$00$$

(Complete the division by neglecting decimal-sign)

$\therefore$ $1.33 \div 7 = 0.19$

Illustration 8 : $22.5 \div 18$

Solution :

$$18\overline{)22.50}\quad 1.25$$
$$-18$$
$$045$$
$$-36$$
$$90$$
$$-90$$
$$00$$

To complete division, place extra zeros as per requirement.

$\therefore$ $22.5 \div 18 = 1.25$

Illustration 9 : $0.1 \div 8$

Solution :

$$\begin{array}{r} 0.0125 \\ 8\overline{)0.1000} \\ -8 \\ \hline 20 \\ 16 \\ \hline 40 \\ 40 \\ \hline 00 \end{array}$$

$\therefore\ 0.1 \div 8 = 0.0125$

Illustration 10 : $0.06 \div 5$

Solution :

$$\begin{array}{r} 0.012 \\ 5\overline{)0.060} \\ 5 \\ \hline 10 \\ -10 \\ \hline 00 \end{array}$$

$\therefore\ 0.06 \div 5 = 0.012$

Note : In this method, we do division upto two or three decimal place in quotient.

Illustration 11 : $1 \div 3$

Solution :

$$\begin{array}{r} 0.33 \\ 3\overline{)1.00} \\ -9 \\ \hline 10 \\ -9 \\ \hline 1 \end{array}$$

Explaination : See, here remainder 1 is recurring.

So, in quotient 3 is recurring.

Answer (quotient) of this type of division is written as follows :

$$1 \div 3 = \frac{1}{3} = 0.33... = 0.\dot{3}$$

A dot is placed on the digit which is recurring.

Illustration 12 : $3 \div 11$

Solution :

$$\begin{array}{r} 0.2727 \\ 11\overline{)3.0000} \\ -22 \\ \hline 80 \\ -77 \\ \hline 30 \\ -22 \\ \hline 80 \\ -77 \\ \hline 3 \end{array}$$

Explaination : See, here in the remainder 8 and 3 are recurring and in quotient 2 and 7 are recurring.

So, it is written as...

$3 \div 11 = 0.2727...$

$= 0.\dot{2}\dot{7}$

Dot is placed on both 2 and 7 as they are recurring.

$\therefore\ 3 \div 11 = 0.\dot{2}\dot{7}$

Practice 3

1. Dividing the following :

(1) 6.69 ÷ 3 (2) 14.63 ÷ 11 (3) 13.92 ÷ 12

(4) 48.3 ÷ 14 (5) 2.214 ÷ 18 (6) 45.645 ÷ 15

(7) 8.892 ÷ 19 (8) 39.39 ÷ 13

- **Division of decimal fraction by 10, 100 and 1000 :**

Dear friends, we have learnt the product of decimal fraction by 10, 100 and 1000. So, now let us see the division of decimal fraction by 10, 100 and 1000.

- **See and understand :**

Decimal fraction	Division by 10	Division by 100	Division by 1000
6.7	$6.7 \div 10$ $=\frac{67}{10}\times\frac{1}{10}$ $=\frac{67}{100}=0.67$	$6.7 \div 100$ $=\frac{67}{10}\times\frac{1}{100}$ $=\frac{67}{1000}=0.067$	$6.7 \div 1000$ $=\frac{67}{10}\times\frac{1}{1000}$ $=\frac{67}{10000}=0.0067$
26.4	$26.4 \div 10$ $=\frac{264}{10}\times\frac{1}{10}$ $=\frac{264}{100}=2.64$	$26.4 \div 100$ $=\frac{264}{10}\times\frac{1}{100}$ $=\frac{264}{1000}=0.264$	$26.4 \div 1000$ $=\frac{264}{10}\times\frac{1}{1000}$ $=\frac{264}{10000}=0.0264$
234.2	$234.2 \div 10$ $=\frac{2342}{10}\times\frac{1}{10}$ $=\frac{2342}{100}=23.42$	$234.2 \div 100$ $=\frac{2342}{10}\times\frac{1}{100}$ $=\frac{2342}{1000}=2.342$	$234.2 \div 1000$ $=\frac{2342}{10}\div 1000$ $=\frac{2342}{10000}=0.2342$

Let us see some other illustrations.

$345.6 \div 10 = 34.56$

$345.6 \div 100 = 3.456$

$345.6 \div 1000 = 0.3456$

On the basis of above illustrations we conclude that,

- If decimal fraction is divided by 10, then decimal-sign moves one decimal place left side.
- If decimal fraction is divided by 100, then decimal-sign moves two decimal place left side.
- If decimal fraction is divided by 1000, then decimal-sign moves three decimal place left side.

1. Fill in the blank :

(1) $1.4 \div 10 =$ _____ (2) $24.6 \div 100 =$ _____

(3) $23.2 \div 100 =$ _____ (4) $35.7 \div 1000 =$ _____

(5) $324.4 \div 100 =$ _____ (6) $620.5 \div 1000 =$ _____

(7) $0.2 \div 10 =$ _____ (8) $2 \div 100 =$ _____

- **Practical problems :**

In our daily life, sometimes we have to do multiplication and division. Let us see some illustrations.

Illustration 13 : A ration card owner gets 1 kg and 250 gm rice per head at Fair value store, then a family of 5 members would get how much rice ?

Solution : 1 kg 250 gm = 1.250 kg

1 person gets = 1.250 kg rice

∴ 5 person gets = (1.250 kg × 5) kg

= 6.250 kg

$$\begin{array}{r} 1.250 \\ \times \quad 5 \\ \hline 6.250 \end{array}$$

∴ 5 members would get 6.250 kg rice.

Illustration 14 : Pirojbhai bought clothes of 9 m and 60 cm length. From this, he makes 6 pieces of equal length. How much is the length of each piece ?

Solution : 9 m 60 cm = 9.60 m

length of 6 pieces = 9.60 m

∴ length of 1 piece = (9.60 ÷ 6) m

= 1.60 m

Length of each piece = 1.60 m

$$6\overline{)9.60}\ 1.60$$
$$-6$$
$$36$$
$$-36$$
$$000$$

Illustration 15 : Jalpa bought 14 pencils each cost of 1 rupee and 75 paise, and she bought 1 pen cost of ₹ 13.50. How much rupees she has to spent ?

Solution : 1 rupee 75 paise = ₹ 1.75

Cost of a pencil = ₹ 1.75

∴ Cost of 14 pencils = ₹ (1.75 × 14)

= ₹ 24.50

$$1.75 \times 14$$
$$1750$$
$$+700$$
$$24.50$$

Total money spent by Jalpa :

₹ 24.50 of pencils

\+ ₹ 13.50 of pen

₹ 38.00 Total

∴ **Jalpa has to spent ₹ 38.00.**

Illustration 16 : A hawker sells 4 sweetlimes at the cost of ₹ 14. If Piyush has to buy 15 sweetlimes, then how much rupees he has to spent ?

Solution : Cost of 4 sweetlimes = ₹ 14

∴ Cost of 4 sweetlimes = ?

$$\frac{15\times14}{4}=\frac{15\times7\times2}{2\times2}=\frac{15\times7}{2}=\frac{105}{2}=₹\ 52.50$$

∴ **Piyush has to spent ₹ 52.50.**

Illustration 17 : A merchant had 25 kg and 750 gm rice. He buys another 25 kg and 500 gm rice. Out of these, he sold 42 kg 750 gm rice. Find the remaining rice.

Solution : 25 kg 750 gm = 25.750 kg

25 kg 500 gm = 25.500 kg

42 kg 750 gm = 42.750 kg

25.750	kg	rice bought	51.250	kg	total rice
+ 25.500	kg	another rice	− 42.750	kg	rice sold
51.250	kg	total rice	08.500	kg	remains

The merchant has 8.500 kg rice.

Ramanbhai buys some items from a shop. Details of the bill is given. Fill up the table as per the calculation of illustration.

Provision Store

Name : Ramanbhai Dt. 10-10-13

Bill no. : 161

Details	Rate (₹/kg)	Quantity	Total (₹)
Sugar	29.50	4 kg	118.00
Wheat	18.25	2.5 kg	.....
Mung	82.50	3 kg	.....
Tuverdal	.....	2 kg	128.50
Rice	.....	3 kg	61.50
Total	.....	.....	

Illustration :

Price of Sugar

1 kg	₹ 29.50
4 kg	?

29.50

× 4

118.00

Price of sugar is ₹ 118.00.

Practice 5

1. If cost of a pen is ₹ 6.25 then how much rupees are needed to buy 14 such pens ?

2. Prabhaben donates ₹ 1001 to buy some items for 50 students of standard 1 of a school. If this money is divided equally, then each student gets educational items of how much amount ?
3. A shopkeeper had 12.500 kg potatoes. He bought another 15 kg potatoes. Out of these, he sold out 17.250 kg potatoes. Now, how much potatoes remains with shopkeeper ?
4. Out of 100 metre clothes, 12 pieces of 2 metre and 25 cm sold out, then find the remaining clothes.
5. How much rupees are necessary for Jigna to buy 5 toothbrush, each costing ₹ 12.50 and a toothpaste costing ₹ 34.50 ?

- **Division of decimal fraction by the decimal fraction :**

Illustration 18 : $1.5 \div 0.5$

Solution : $1.5 \div 0.5$

$= \frac{15}{10} \div \frac{5}{10}$

$= \frac{15}{10} \times \frac{10}{5}$

$= 3$

Illustration 19 : $2.4 \div 0.06$

Solution : $2.4 \div 0.06$

$= \frac{24}{10} \div \frac{6}{100}$

$= \frac{24}{10} \times \frac{100}{6}$

$= 40$

Illustration 20 : $0.15 \div 0.5$

Solution : $0.15 \div 0.5$

$= \frac{15}{100} \div \frac{5}{10}$

$= \frac{15}{100} \times \frac{10}{5}$

$= \frac{3}{10} = 0.3$

Exercise

1. Hitesh and Hiral goes to market to buy some items for their home. Rate of items are in kg. Answer the following questions on its base :

Mung	Wheat	Sugar	Rice	Tuverdal
₹ 60.50	₹ 15	₹ 30.50	₹ 20.50	₹ 72.00

(1) How much is the price of 2 kg Mung ? _____

(2) How much is the price of 9.250 kg Wheat ? _____

(3) How much is the price of 2.500 kg Sugar ? _____

(4) How much is the price of 5 kg Rice ? _____

(5) How much is the price of 1.500 kg Tuverdal ? _____

(6) What is the total cost of Mung, Wheat and Sugar, if they bought it as above ? _____

(7) What is the total weight of Mung, Wheat and Sugar ? _____

2. Solve the following :

(1) Out of 12 kg chilly powder, 35 packets are prepared each of 250 gm. Find the weight of remaining chilly powder.

(2) A hawker sells 4 Oranges in ₹ 15. Wahab has to buy 20 Oranges. So, he has to spent how much rupees ?

Activity : Dear friends, your parents would buy grossery. Fill up the table by knowing rate and monthly requirement of different items :

Details	Monthly requirement	Rate	Amount
Wheat Rice Sugar Salt			
Total			

3. Divide the following :

(1) 3.6 ÷ 0.6 (2) 1.5 ÷ 0.05 (3) 0.24 ÷ 0.6

Answers

Practice 1

(1) 9 (2) 0.42 (3) 63.045 (4) 0

(5) 8.4 (6) 3.27 (7) 39.852 (8) 145.73

Practice 2

(1) 34 (2) 5 (3) 46 (4) 29.7

(5) 250 (6) 3400 (7) 210 (8) 224

Practice 3

(1) 2.23 (2) 1.33 (3) 1.16 (4) 3.45

(5) 0.123 (6) 3.043 (7) 0.468 (8) 3.03

Practice 4

(1) 0.14 (2) 0.246 (3) 0.232 (4) 0.0357

(5) 3.244 (6) 0.6205 (7) 0.02 (8) 0.02

Practice 5

(1) ₹ 87.50 (2) ₹ 20.02 (3) 10.250 kg

(4) 73 metre (5) ₹ 97

Exercise

1. (1) ₹ 121 (2) ₹ 138.75 (3) ₹ 76.25

(4) ₹ 102.50 (5) ₹ 108 (6) ₹ 336 (7) 13.750 kg

2. (1) 3.250 kg (2) ₹ 75

3. (1) 6 (2) 30 (3) 0.4

6 Ratio and Proportion

- **Let us remember :**

See the following pictures and do as per illustration :

Here,

(1) How much times is the cost of umbrella then wrist-watch ?

Here, price of wrist watch is ₹ 300 and price of umbrella is ₹ 100. 300 is three times more than 100.

- So, price of wrist watch is three times more than the price of umbrella.
- Price of the umbrella is one-third of price of wrist-watch.

(2) How much times is the price of duster then chalk box ?

(3) How much part is the cost of chalk box then the cost of duster ?

(4) Compare the cost of shoes and socks as above.

(5) From the given pictures except 1, 2, 3, 4 questions compare the cost of two objects. (Prepare/Form questions by your own.)

- **Activity :**
  - Read and do it as per instructions :

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

- **Fill in the blanks with the help of how much times or how much parts and make a symbol on the digit according to instructions :**

(1) 2, 4, 8, _____, _____, _____ do ◯ on it.

(2) 1, 3, 9, _____, _____, _____ do ☐ on it.

(3) 11, 22, 44, _____, _____, _____ do △ on it.

(4) 80, 40, 20, _____, _____, _____ do ⬠ on it.

(5) 96, 48, 24, _____, _____, _____ do ⬡ on it.

- **Game 1 :**

36	35	34	33	32	31
	Fifth part of 35	–	Third part of 33	–	–
25	**26**	**27**	**28**	**29**	**30**
–	Half of 26	Ninth part of 27	Half of 28	29th part of 29	–
24	**23**	**22**	**21**	**20**	**19**
Fourth part of 24	–	–	Third part of twenty one	–	–
13	**14**	**15**	**16**	**17**	**18**
–	–	Third part of fifteen	Half of sixteen	Double of seventeen	–
12	**11**	**10**	**9**	**8**	**7**
–	Double of eleven	Fifth part of ten	Three times of nine	Second part of eight	–
1	**2**	**3**	**4**	**5**	**6**
–	Seven times of 2	Two times of 3.	–	Fifth part of 5	–

- **Rules of the game :**

1. This game can be played by any number of persons.
2. Take a coin for each person. Place it on 'Home'.
3. Take a die. Throw it, move ahead according to the number on the face of die.
4. When you reach on any number, move on according to the instruction given there.
5. If instructions is not written then wait for your next turn.
6. If two coins come on the same box, then the coin which reached first, he has to go 'Home' again.
7. Whose coin reached first at number 36 ? He / She is the winner.

- **Read and understand :**

Illustration 1 : Sapna has ₹ 10 and Asha has ₹ 40.

We can say four points about the comparision of amount they have.

(1) Asha has how much more rupees, then Sapna ? **₹ 30**

(2) Sapana has how much less rupees, then Asha ? **₹ 30**

(3) Asha has how much times more rupees, than Sapna ? **4 times**

Here Asha has ₹ 40. Which is four times than 10. **[40 = 4 × 10]**

So, it is said that Asha has four times more rupees than Sapana.

(4) Sapana has how much part of rupees than Asha ? **Fourth part**

Here, Sapana has ₹ 10, which is fourth part of 40, $\left[10=\frac{40}{4}\right]$. So, it is said that it is fourth part.

Illustration 2 : Cost of a ring is ₹ 30 and cost of a chain is ₹ 60. For this, we can compare four points as follows. (Write your answer.)

(1) Cost of a chain is how much more than cost of a ring ? _____

(2) Cost or a ring is how much rupees less than cost of a chain ? _____

(3) Cost of a chain is how much times than the cost of a ring ? _____

(4) Cost of a ring is how much part of the cost of a chain ? _____

Illustration 3 : Cost of a dish is ₹ 48 and cost of a bowl is ₹ 16, then compare the cost of a dish and a bowl as per previous illustration.

- **Fill is yourself :**

(1) _____, _____

(2) _____, _____

(3) _____, _____

(4) _____, _____

Thus, we can compare the things in our everyday life. We can compare the things in two ways :

(1) Method of difference

(2) Method of ratio.

With the help of method of difference, we know that value of one thing is how much more or less than other. While, with the method of ratio, it is known that value of one thing is how much times or part of than other.

In previous illustration : In (1) and (2) information in 1 and 2 shows the comparision by method of difference and information in no. 3 and 4 shows the comparision by the method of ratio.

- **Ratio :** The comparision, which shows one number is how much times or how much part of other number is called Ratio.

It is denoted as $a : b$ (Read : a is to b) or $\frac{a}{b}$.

- **Remember :**
  - For ratio or comparision units of both measures must be same.

    e.g. It is not possible to find ratio of 18 cm and 51 kilogram.
  - Ratio is denoted as $\frac{\text{Numerator}}{\text{Denominator}}$ or Numerator : Denominator.
  - Ratio is written in its simplest form.

- **To find Ratio :**

Illustration 4 : Find ratio of 3 and 9.

Solution : $\frac{3}{9} = \frac{3\times1}{3\times3} = \frac{1}{3}$

Ratio of 3 and 9 is $\frac{1}{3}$ or 1:3.

Illustration 5 : Find ratio of 20 paise and 3 rupees.

Solution : Here, we have to convert the different units into same units.

₹ 3 = 300 paise

Now, $\frac{20}{300} = \frac{1\times20}{15\times20} = \frac{1}{15}$

Ratio of 20 paise and 3 rupees is $\frac{1}{15}$ or 1:15.

While finding ratio write first number in numerator and second number in denominator. In previous illustration (5)...

In previous illustration : In (5)

(1) Ratio of 20 paise and 3 rupees is 1:15,

It is written as $\frac{20}{300} = \frac{1}{15}$.

(2) Ratio of 3 rupees and 20 paise is 15:1,

It is written as $\frac{300}{20} = \frac{15}{1}$.

- **Think :**

(1) What is the ratio of 15 and 19 ?

(2) What is the ratio of 9 and 21 ?

(3) What is the ratio of 5 litre and 10 metre ?

(4) Ratio of 30 minutes and 20 gram is possible ?

(5) Find ratio of 700 cm and 21 metre.

(6) Find ratio of 720 gram amd 12 kg.

Practice 1

(1) Cost of a pair of scissor is ₹ 40 and cost of a pen is ₹ 10, then find the ratio of cost of the pair of scissor and the pen.

(2) In a school, in standard 6, number of boys are 30 and number of girls are 20, then find the ratio of number of boys and girls.

(3) Weight of Pratik is 40 kg and weight of his father is 50 kg. Find the ratio of weight of Pratik and his father.

(4) Cost of a belt is ₹ 60 and cost of shoes is ₹ 150, then find the ratio of cost of the belt and shoes.

- **Read and understand :**

Illustration 6 : Reena spent ₹ 24 for 6 ballpens. Shailee spent ₹ 32 for 8 same ballpens. Find the ratio of number of ballpens and also find the ratio of cost of ballpens spent by both the friends.

Solution : Ratio of number of ballpens $= \frac{\text{Number of ballpens of Reena}}{\text{Number of ballpens of Shailee}}$

$= \frac{6}{8}$

$= \frac{2 \times 3}{2 \times 4}$

Ratio of number of ballpens $= \frac{3}{4}$

Now, Ratio of money spent by both $= \frac{\text{Cost spent by Reena}}{\text{Cost spent by Shailee}}$

$= \frac{24}{32}$

$= \frac{8 \times 3}{8 \times 4}$

Ratio of cost of ballpens $= \frac{3}{4}$

In this illustration ratio of No. of ballpens and ratio of cost of ballpens are same. Therefore, 6, 8, 24 and 32 are called in proportion.

- **Proportion :**
  - **If two ratios are given same, then those four numbers are called in same proportion. It is denoted by :: or = symbol.**

In illustration 6, 6 and 8, 24 and 32 are in same ratio, therefore they are called in same proportion. It is denoted as 6 : 8 :: 24 : 32 or 6 : 8 = 24 : 32.

- **Know these :**
  - Proportion shows the relation between two ratios.
  - In proportion total four numbers (term) are there.
  - If four numbers are in proportion, then product of first and fourth numbers and product of second and third numbers are same.

    For illustration 6; 6, 8, 24, 32

    Product of first and fourth number = 6 × 32 = 192

    Product of second and third number = 8 × 24 = 192

    So, it is said that 6, 8, 24 and 32 are in proportion.

Illustration 7 : Verify that 4, 5, 6 and 7 are in proportion or not ?

Solution : Ratio of 4 and 5 = $\frac{4}{5}$

Ratio of 6 and 7 = $\frac{6}{7}$

They are not same ratios, therefore 4, 5, 6 and 7 are not in proportion.

or

Here, product of first and fourth number = 4 × 7

= 28

Product of second and third number = 5 × 6

= 30

These products are also not same. So, it is said that 4, 5, 6 and 7 are not in proportion.

Practice 2

❖ **Check the following numbers are in proportion or not ?**

(1) 3, 7, 9, 21

(2) 7, 6, 12, 13

(3) 4, 8, 10, 20

(4) 10, 15, 16, 24

(5) 25, 30, 40, 50

(6) 9, 11, 20, 21

● **Activity 2 :**

Fill up the following table from given pictures and write cost of one item :

No.	Cost of items / Name	Cost of 1 item	Cost of 2 item	Cost of 3 item	Cost of 4 item	Cost of 5 item	Number of items increases or decreases?	Cost increases or decreases?
(1)	Ballpen							
(2)	Chocolate							
(3)	Drawing-book							
(4)	Spects							
(5)	School-bag							

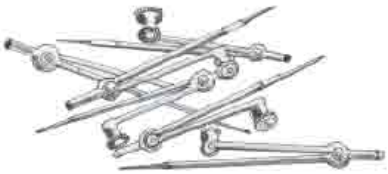
❖ **Cost of 1 dozen (12 nos.) items are given as per following pictures. Fill up the table from that :**

Scale

₹ 60

Compass-box

₹ 132



Rounder

₹ 96

Notebook

₹ 144

File

₹ 240

No.	Name of item	Cost of 12 Nos	Cost of 6 Nos.	Cost of 3 Nos.	Cost of 1 No.	No. of item increases or decreases?	Cost increases or decreases?
(1)	Scale						
(2)	Rounder						
(3)	File						
(4)	Notebook						
(5)	Compass-box						

- **Direct Proportion :** When one quantity increases, at the same time the other quantity also increases at the same way or when one quantity decreases, at the same time, the other quantity also decreases at the same way, then these quantities are called in direct proportion.
  - In direct proportion, ratios are same.
- **Know these :**
  - When quantities are in direct proportion and when we have to find one information out of four, then it is calculated as below :

Information about same units...

a : b

c : d

If a, b, c and d are in direct proportion and if d has to be found then...

$$d = \frac{b \times c}{a}$$

Illustration 8 : If cost of 6 chocolates is ₹ 3, then find the cost of 14 chocolates.

Solution : Here, when number of chocolates increases, then its cost also increases. So, according to direct proportion.

No. of chocolates	Cost (₹)
$a = 6$	$b = 3$
$c = 14$	$d = ?$

$$d = \frac{b \times c}{a}$$

$$= \frac{3 \times 14}{6}$$

$$= \frac{2 \times 3 \times 7}{3 \times 2}$$

$= 7$ $\therefore$ $d = 7$ Thus, cost of 14 chocolates is ₹ 7

- **Another method :**

Cost of 6 chocolates = ₹ 3

Cost of 14 chocolates = ?

$$= \frac{14 \times 3}{6}$$

= ₹ 7

Practice 3

(1) Total 100 kg wheat is to be filled in 5 jute bags of equal size, then in such 7 jute bags how much kilogram wheat is to be filled ?

(2) Four boxes of equal sizes contain 240 soaps, then in such three boxes how many soaps are there ?

(3) 3600 litre water is needed to fill up six tanks of equal sizes, then with 8400 litre water how many such tanks are needed ?

(4) To buy 8 waterbags of equal size ₹ 560 is necessary, then how much amount is necessary to buy five such waterbags ?

(5) A printing machine takes 15 minute to print three pages of a book. If the book contains 56 pages, then how much time is taken to print total book by this machine ?

- **Read and understand :**

Khyatiben has 100 chocolates. If she distributes cholocates to the children as per following manner, then observe the number of chocolates obtained by each child.

No. of children		No. of chocolates obtained by each child	
100		1	
50	No. of	2	No. of chocolates
25	children	4	obtained by
20	decreases	5	each child
10	↓	10	increases
5		20	↓
2		50	
1		100	

- **Inverse Proportion :**

When one quantity (measure) increases, at the same time, another quantity decreases at the same rate or if one quantity decreases, then another quantity increases at the same rate then these quantities are called in inverse proportion.

❖ **Know these :**

When quantities are in inverse proportion and if we have to find one information out of four then,

Information of same units	Related information
a	b
c	d to find

$$\therefore \quad d = \frac{a \times b}{c}$$

Illustration 9 : In a school, during midday -meal, grains for 140 students lasts for 25 days. If these grains lasts for 35 days, then how many children are there in the school ?

Solution :

Days	Children
$a = 25$	$b = 140$
$c = 35$	$d = ?$

$$d = \frac{a \times b}{c}$$

$$= \frac{25 \times 140}{35}$$

= 100 children are there.

Illustration 10 : Grains purchased from flood relief-fund, is distributed among 1500 persons then each would get 12 kg grains. If the same amount of grains is distributed among 900 persons then one would get how much kg grains ?

Solution :

Persons	Grains (in kg)
$a = 1500$	$b = 12$
$c = 900$	$d = ?$

$$d = \frac{a \times b}{c}$$

$$= \frac{1500 \times 12}{900}$$

$= 20$ $\quad \therefore d = 20$ kg grains

Practice 4

(1) Kanchanben distributes some chocolates among 300 students, then one would get 4 chocolates. If she distributes same chocolates among 400 students then one would get how much chocolates ?

(2) In a class 15 benches are there. 4 students are sitting on each bench. If number of students remains same and 12 benches are there then on each bench how many students have to sit ?

(3) Mansukhbhai distributes some kg of grains among 150 persons then each would get 7 kg grains, whereas Jitubhai distributes same kg of grains among 210 persons, then how much amount of grains each would get ?

(4) Amount of blind person fund collected from a school of a village is distributed among 81 persons, then each would get ₹ 600. If the same amount is distributed among 54 persons then find the amount obtained by each person.

- **Activity 3 :** (1) In your village or a city go to the nearest provision store or fairdeal price store, and make a list for the proportion (amount) of different grains, oil, kerosene etc. items. If all these items are distributed to your friend/neighbour's family member, then make a list that each would get how much amount ? One illustration is given below, perpare another table like this for your information.

Name	Amount
Wheat	200 kg
Rice	160 kg
Bajara	80 kg
Sugar	140 kg
Oil	400 litre
Kerosene	320 litre

No.	Friend's Name	No. of family member	Per person					
			Wheat	Rice	Bajara	Sugar	Oil	Kerosene
(1)	Astha	4	50 kg	40 kg	20 kg	35 kg	100 litre	80 litre

Exercise

(1) Price of a scooter is ₹ 45,000 and price of a bicycle is ₹ 5000, then find the ratio of price of bicycle and a scooter.

(2) In a cloth-shop there are 150 metre silk clothes and 200 metre cotton clothes, then find its ratio.

(3) Verify that following digits are in proportion or not :
(1) 2, 7, 14, 49 (2) 3, 21, 5, 35 (3) 2, 11, 4, 21

(4) Ektaben could buy eleven similar purses in ₹ 1320, if she gives ₹ 960, then how many such purse could she buy ?

(5) A car covers 120 km distance in 3 litre petrol, if 7 litre petrol is filled up in the car tank, then find the distance covered by the car.

(6) In a school, on a clean village-day 150 students takes 6 hours to clean village, if 180 students do this work, then find the time to clean the village completely.

(7) In a school, during cultural activity programme, donation obtained from donor is distributed among 33 winning students then each would get ₹ 80. If this amount is distributed among winners of sports-competition, then each would get ₹ 120, then how many students win the sports-competition ?

What have we learnt ?

- A number is how much times or how much part of another number, this comparision is called ratio. It is denoted as : (is to).
- For ratio both units must be same.
- Ratio is denoted as in its simplest form.
- The numbers, which both ratios are same, then these four numbers are called in proportion. It is denoted as :: or =. $[a : b :: c : d]$
- If one quantity increases, at the same time other quantity also increases or one quantity decreases at the same time another quantity also decreases then it is called direct proportion.
- For direct proportion, formula is $d = \frac{b \times c}{a}$.
- If one quantity increases, then another decreases and if one quantity decreases, then another increases, then it is called inverse proportion.

  Its formula is $d = \frac{a \times b}{c}$.

Answers

Practice 1

(1) 4 : 1 (2) 2 : 3 (3) 4 : 5 (4) 2 : 5

Practice 2

(1) In proportion (2) Not in proportion (3) In proportion

(4) In proportion (5) Not in proportion (6) Not in proportion

Practice 3

(1) 140 kg wheat (2) 180 soaps

(3) 14 tanks (4) ₹ 350

(5) 280 minutes or 4 hours 40 minutes

Practice 4

(1) Each would get 3 chocolates (2) 5 students would sit

(3) 5 kg grain (4) ₹ 900

Exercise

(1) 1 : 9

(2) 3 : 4

(3) (1) In proportion (2) In proportion (3) Not in proportion

(4) Ektaben could buy 8 purses.

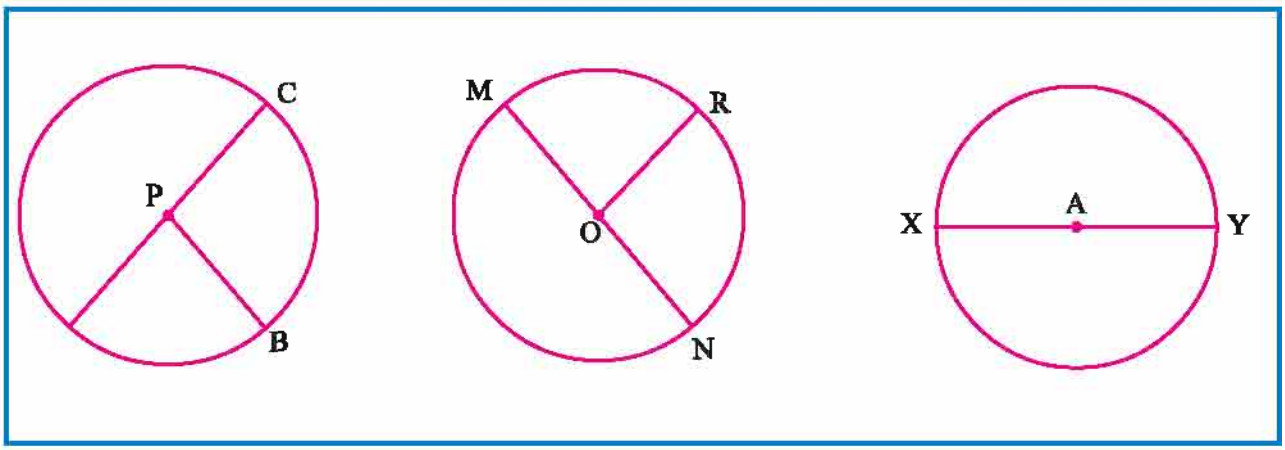
(5) Car can cover 280 km distance.

(6) Clean village in 5 hours.

(7) 22 students are winner.

7 Circumference and Area of Circle

- **Let us remember :**
  - Measure the following radius of a circle. Fill in the blank given below the figure :

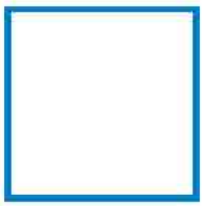


Name of centre _____	**Name of centre** _____	**Name of centre** _____
Measure of radius ____ **cm**	**Measure of radius** ____ **cm**	**Measure of radius** ____ **cm**
Measure of diameter ____ **cm**	**Measure of diameter** ____ **cm**	**Measure of diameter** ____ **cm**

- **Think :**
  - Measure of diameter is how much times more than measure of radius ?
  - Measure of radius is how much then measure of diameter ?
  - What is the measure of diameter of a circle whose radius is 12 m ?
  - What is the measure of radius of a circle whose diameter is 20 m ?

- Radius is denoted as r.
- Diameter is denoted as d.
- Diameter $= 2 \times$ radius, $\therefore d = 2 \times r = 2r$
- Radius $= \frac{\text{diameter}}{2}$ $\therefore r = \frac{d}{2}$

- **Recognize the following figures and find its perimeter :**



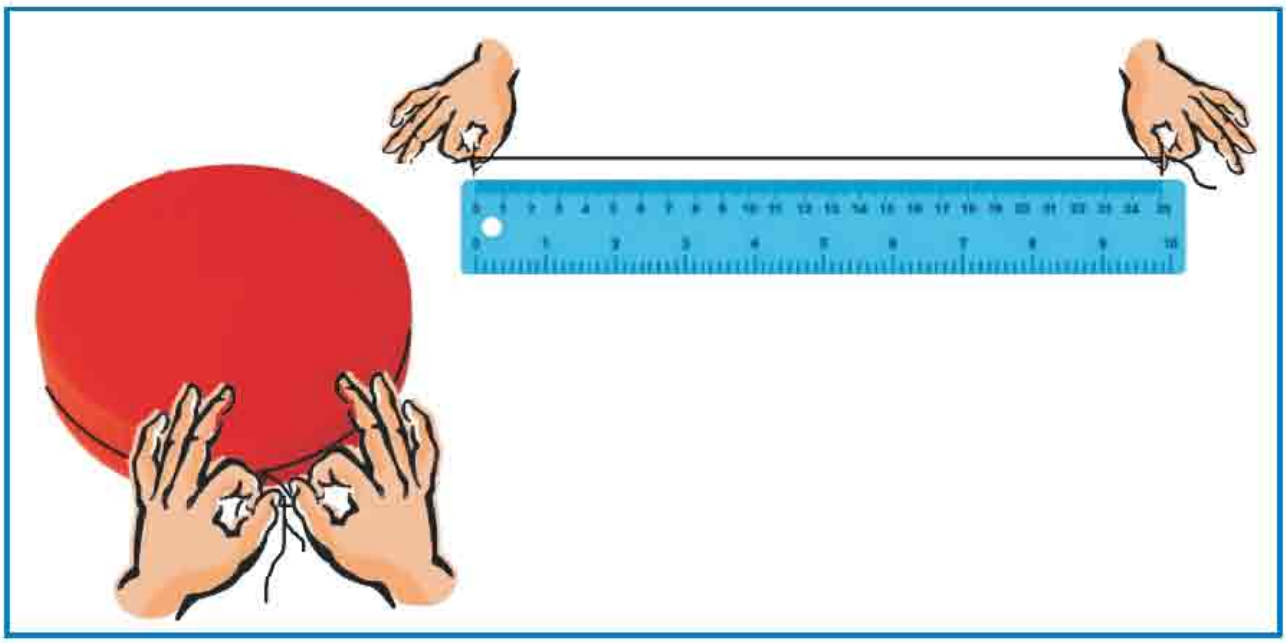
Perimeter = _____

Perimeter = _____

- **Think :**
  - What is the perimeter of a square ?
  - What is the perimeter of a rectangle ?
  - Formula to find perimeter of a square is _____ .
  - Formula to find perimeter of a rectangle is _____ .

- **Let us learn new :**

One day, Nija found a cap of a bottle, she measures the edge of a cap with the help of a string. It is really fun for her. See, how she does it ?

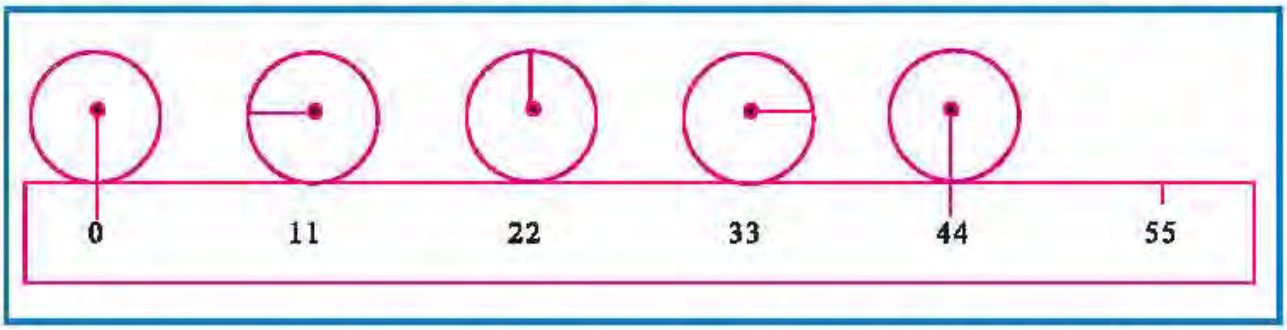


Now, collect the following items and measure their circular edge with the help of string.

Now, measure the circular edges of above items with scale. See how are the measures ?

Activity 1 : Let us cut a circle from the card-board and measure its length of the edge. For this follow the given steps.

- Draw a circle of 7 cm radius on a thin card-board or drawing-paper and cut it with a pair of scissor.
- Draw a radius in the circle. Make a small hole at the centre, so you can fix a nail in it.
- Now, fix a nail or bicycle spoke in the hole then make sure that card-board is freely moving or not.
- Now, according to given figure, fix up the metre-scale on a wooden scale.



- On this metre-scale, keep the radius of a circle, such that it makes 90° angle (right angle) with '0' digit of a metre-scale.
- Now, roll the circle, note down the digit when radius of the circle again makes 90° angle with the edge of metre-scale.

Activity 2 : Now, measure the length of the circular edge of card-board with the help of string.

- In activity 1, which digit do you notedown ?
- In activity 2, what is the length of the string ?

From above activities we measure the length of circular edge. Which is called perimeter of a circle. Perimeter of a circle is known as circumference.

Activity 3 :

- Cut the circle of 3.5 cm, 7 cm, 10.5 cm and 14 cm radii from card-board and measure the circumference.
- Fill up the following table from your activity :

No.	Radius (r)	Diameter (d)	Circum-ference	If circumference is divided by diameter Circumference ÷ Diameter	If diametre is multiply by $\frac{22}{7}$ Diameter × $\frac{22}{7}$
(1)	3.5 cm				
(2)	7 cm				
(3)	10.5 cm				
(4)	14 cm				

- When circumference is divided by diameter then what is the result everytime ?

Ratio of circumference and diameter is shown as π (Pi). π is a greek alphabet. Value of π is taken approximate.

Multiplication of diameter and π is equal to circumference.

∴ Circumference = π × diameter

Also, we know that diameter = 2 × radius

Therefore, circumference = π × 2 × radius

$\therefore$ Circumference = $2 \times \pi \times$ radius (commutative law for multiplication)

Circumference = $\pi \times$ radius	Circumference = $2 \times \pi \times$ radius
$\therefore$ Circumference = $\pi \times d = \pi d$	$\therefore$ Circumference = $2 \times \pi \times r$
	$\therefore$ Circumference = $2\pi r$

Now, activity is not necessary every time to find circumference of a circle. But it is known from above relation. e.g...

Illustration 1 : Find circumference of a circle having radius 7 cm.

Solution : Radius = r = 7 cm

$\therefore$ Circumference of a circle = ?

$\therefore$ Circumference of a circle = $2\pi r = \frac{2}{1} \times \frac{22}{\cancel{7}} \times \frac{\cancel{7}}{1}$

$= 44$ cm

$\therefore$ Circumference of a circle is 44 cm.

Illustration 2 : Find circumference of a circle of diameter 21 metre.

Solution : Diameter = d = 21 m

Circumference of a circle = ?

$\therefore$ Circumference of a circle = πd

$= \frac{22}{\cancel{7}} \times \frac{\overset{3}{\cancel{21}}}{1}$

$= 22 \times 3$

$= 66$ m

$\therefore$ Circumference of a circle is 66 m.

Illustration 3 : Find circumference of a circle of radius 2.8 metre.

Solution : Radius $= r = 2.8$ m

Circumference of a circle $= ?$

$\therefore$ Circumference of a circle $= 2\pi r$

$$= 2 \times \frac{22}{7} \times 2.8$$

$$= \frac{2}{1} \times \frac{22}{\cancel{7}} \times \frac{\overset{4}{\cancel{28}}}{10}$$

$$= \frac{2 \times 22 \times 4}{10}$$

$$= \frac{176}{10}$$

$$= 17.6 \text{ m}$$

$\therefore$ Circumference of a circle is 17.6 metre.

Illustration 4 : Find the circumference of a circle of diameter 6.3 cm.

Solution : Diameter $= d = 6.3$ cm

Diameter of circle $= ?$

$\therefore$ Circumference of a circle $= \pi d$

$$= \frac{22}{7} \times 6.3$$

$$= \frac{22}{\cancel{7}} \times \frac{\overset{9}{\cancel{63}}}{10}$$

$$= \frac{22 \times 9}{10}$$

$$= \frac{198}{10}$$

$= 19.8$ cm $\therefore$ Circumference of a circle is 19.8 cm.

Practice 1

1. Calculate circumference of a circle from given information :

No.	Radius (r)	Diameter (d)	Circumference
(1)	70 cm	_____	_____
(2)	_____	14 metre	_____
(3)	49 metre	_____	_____
(4)	3.5 cm	_____	_____
(5)	_____	42 metre	_____
(6)	_____	5.6 cm	_____

2. Find circumference of a circle of diameter 140 cm.

3. Find circumference of a circle of radius 56 metre.

4. Find circumference of a circle of diameter 4.2 cm.

5. Find circumference of a circle of radius 9.8 cm.

6. Find circumference of a circle of diameter 9.1 metre.

- When measure of radius of a circle is given, then to find circumference of a circle formula 'circumference = $2\pi r$'.
- When measure of diameter of a circle is given, then to find circumference of a circle formula 'circumference = πd'.

- **Practical problems about circumference :**

Illustration 5 : Radius of a wheel is 35 cm. If the wheel rotates 100 turns, then find the distance covered by it.

Solution : To find distance covered by the wheel, first we have to find its circumference.

Radius of the wheel = r = 35 cm

$\therefore$ Circumference of the wheel = $2\pi r$

$$= 2 \times \frac{22}{\cancel{7}_{1}} \times \cancel{35}^{5}$$

$$= 2 \times 22 \times 5 = 220 \text{ cm}$$

If wheel rotates 1 rotation, it covers distance equals to circumference.

Distance covered by the wheel in 1 rotation = 220 cm

$\therefore$ Distance covered by the wheel in 100 rotation $= \frac{100}{1} \times 220$

$= 22{,}000$ cm

$= 220$ metre

Illustration 6 : Radius of a circular garden is 28 metre. To prepare a fence surrounding this garden, what is the cost of labour at the rate of ₹ 5 per metre ?

Solution : Here, we want to construct fence, surrounding the circular garden.

So, we have to find circumference of garden.

Radius of circular garden $= r = 28$ metre

$\therefore$ Circumference of circular garden $= 2\pi r$

$= 2 \times \frac{22}{\cancel{7}} \times \cancel{28}^{4}$

$= 2 \times 22 \times 4$

$= 176$ metre

Thus, 176 metre fence is needed, surrounding the garden.

Cost of labour for 1 metre fence = ₹ 5

$\therefore$ Cost of labour for 176 metre fence $= ₹ \left(\frac{176}{1} \times 5\right)$

$= ₹ 880$

$\therefore$ Cost of labour for fence surrounding the circular garden is ₹ 880.

Illustration 7 : Diameter of circular carpet is 49 cm. If it has to be surrouneded by a golden plate then how much plate is needed ? If cost of 10 cm plate is ₹ 10, then find the cost to fix the plate.

Solution : First, find circumference of circular carpet.

Diameter of carpet $= d = 49$ cm

$\therefore$ Circumference of circular carpet $= \pi d$

$$= \frac{22}{\cancel{7}} \times \cancel{49}^{7}$$

$$= 22 \times 7$$

$$= 154 \text{ cm}$$

154 cm long plate is needed.

Cost of fixing 10 cm plate = ₹ 10

$\therefore$ Cost of fixing 154 cm plate = ₹ $\left(\frac{154}{\cancel{10}} \times \cancel{10}\right)$

= ₹ 154

Thus, cost of fixing plates on circular carpet is ₹ 154.

Illustration 8 : Diameter of a wheel is 1.05 metre. If this wheel covers 33 km distance, then find its rotations.

Solution : Diameter = d = 1.05 metre

Circumference of the wheel $= \pi d = \frac{22}{7} \times 1.05 = \frac{22}{\cancel{7}} \times \frac{\cancel{105}^{15}}{100} = \frac{22 \times 15}{100}$

$$= \frac{330}{100}$$

$$= 3.3 \text{ metre}$$

$\therefore$ If wheel rotates 1 rotation, then it covers 3.3 metre distance.

This wheel covers 33 km distance.

$\therefore$ 33 km = 33 × 1000 = 33,000 metre

No. of turns to cover 3.3 m distance = 1

$\therefore$ No. of turns to cover 33000 m distance = $\frac{33000 \times 1}{3.3}$

$= \frac{1000}{\cancel{33000} \times 10}{\cancel{33}}$

$= 1000 \times 10$

$= 10{,}000$

If the wheel covers 33 km distance, then it rotates 10,000 turns (rotations).

(1) Radius of the cricket ground is 70 metre. To make boundary, a rope is to be fixed surrounding it. If cost of fixing the rope of 1 metre is ₹ 20, then what is the total cost to fix the rope on boundary ?

(2) A student makes 4 rounds surrounding the circular ground. If diameter of the ground is 70 metre, then how much metre does the student run ?

(3) Radius of the wheel of a cart is 42 cm. An iron-plate is to be fixed on the edge of wheel, then how much cm long plate is needed ? If cost of 10 plate is ₹ 20, then what is the total cost of iron-plate ?

(4) Sarlaben stiches golden plate on edges of circular bed of 7 metre diameter. Labour to stich golden plate is ₹ 3 per 1 metre. Find the labour charge of Sarlaben.

(5) Diameter of circular lake is 133 metre. Wire fence is done surrounding the lake. Cost to prepare 1 metre wire fencing is ₹ 10, then find the total cost of fencing.

- **Think :**
  - What is called area ?
  - Which units are used to measure area ?

Figure : 1

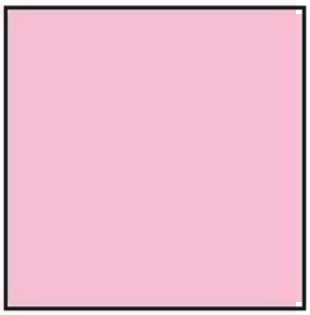


Figure : 2

  - What is the area of fig. 1 ?
  - What is the area of fig. 2 ?
  - Write the formula to find the area of rectangle ? _____
  - What is the formula to find the area of square ? _____

Thus, area means region occupied by any object or figure on the surface or region occupied by closed figure in the plane.

Now, do the following activity to find area of circle.

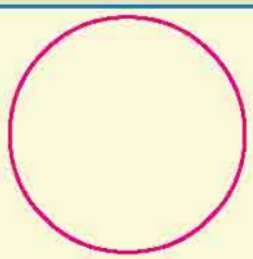
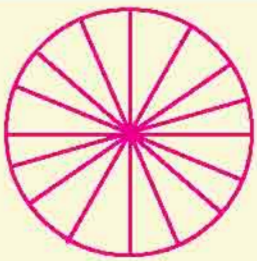
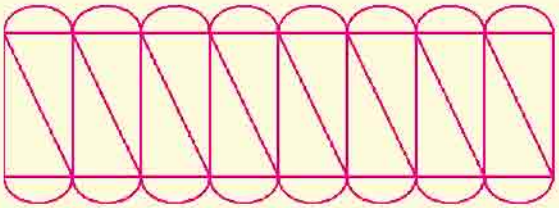
Figure	Understanding
	• Draw a circle of any radius on a card-paper. • Cut the circle.
	• Draw 8 diameters in the circle, so that circle divides into 16 equal parts. • According to diameter cut the 16 parts of circle with a pair of scissor.

Figure	Understanding
	• Arrange all 16 parts up and down according to figure. • Now, a rectangle is formed.

Area of rectangle = length × breadth

Here, length of rectangle is equal to $\frac{1}{2}$ circumference and the breadth is equal to radius.

$$\text{Area of rectangle} = \frac{1}{2} \text{ circumference} \times \text{radius}$$

$$= \frac{1}{2} \times 2\pi r \times r$$

$$= \pi r^2$$

Here, rectangle is formed, from 16 equal parts of circle.

$\therefore$ Area of rectangle = Area of circle

$\therefore$ πr^2 = Area of circle ($\because$ r = radius)

$\therefore$ Area of circle = πr^2

We know that $r = \frac{d}{2}$ (Here, d = diameter)

So, in area of circle = πr^2, place $r = \frac{d}{2}$

$\therefore$ Area of circle = $\pi \left(\frac{d}{2}\right)^2$

$$= \pi \times \frac{d}{2} \times \frac{d}{2}$$

$$= \frac{\pi d^2}{4}$$

$$\therefore \quad \text{Area of circle} = \frac{\pi d^2}{4}$$

Illustration 9 : Find area of circle of radius 7 cm.

Solution : Area of circle = r = 7 cm

$\therefore$ Area of circle = πr^2

$$= \frac{22}{7} \times 7^2$$

$$= \frac{22}{\cancel{7}} \times \frac{\cancel{7}}{1} \times \frac{7}{1}$$

$$= 22 \times 7$$

$$= 154 \text{ sq cm}$$

$\therefore$ Area of circle is 154 sq cm

Illustration 10 : Diameter of circular ground is 42 metre. What is the area of this ground ?

Solution : Diameter of the ground = d = 42 m

Method : 1

$$\text{Radius} = \frac{\text{Diameter}}{2}$$

$$\therefore \quad \text{Radius} = r = \frac{42}{2} = 21 \text{ m}$$

$\therefore$ Area of the ground = πr^2

Method : 2

$$\text{Area of the ground} = \frac{\pi d^2}{4}$$

$$= \frac{22}{7} \times \frac{42^2}{4}$$

$= \frac{22}{7} \times 21^2$

$= \frac{22}{\cancel{7}} \times \frac{\cancel{21}^{3}}{1} \times \frac{21}{1}$

$= 22 \times 3 \times 21$

$= 1386$ sq metre

$= \frac{22}{7} \times \frac{42 \times 42}{4}$

$= 1386$ sq metre

$\therefore$ Area of circular ground is 1386 sq metre.

Illustration 11 : A farmer makes a flower bed of 7 metre radius to sow flowers. He has to buy fertilizer for it. 1 kg fertilizer is necessary for 1 sq m. area. How much fertilizer he has to buy ?

Solution : Here, fertilizer is to buy for circular flower bed. So, first find out area of flower bed.

Radius $= r = 7$ m

$\therefore$ Area of the flower bed $= \pi r^2$

$= \frac{22}{7} \times 7^2$

$= \frac{22}{\cancel{7}} \times \frac{\cancel{7}}{1} \times \frac{7}{1}$

$= 22 \times 7$

$= 154$ sq m

$\therefore$ Area of flower bed is 154 sq m.

$\therefore$ For 1 sq m area = 1 kg fertilizer is necessary.

$\therefore$ For 154 sq m area $= \frac{154}{1} \times 1$

$= 154$ kg

Thus, farmer has to buy 154 kg fertilizer.

Illustration 12 : Dineshbhai wants to draw a painting, in the circle of 140 cm diametre on the wall of his drawing-room. Cost of drawing a painting is ₹ 5 per 100 sq cm, then what amount Dineshbhai has to pay ?

Solution : Here, painting is done on the wall in the circular manner. So, first find out the area of a circle.

Diameter $= d = 140$ cm

$\therefore$ Radius $= r = \dfrac{\text{Diameter}}{2}$

$= \dfrac{140}{2}$

$= 70$ cm

$\therefore$ Area of a circle $= \pi r^2$

$= \dfrac{22}{7} \times 70^2$

$= \dfrac{22}{\cancel{7}} \times \overset{10}{\cancel{70}} \times 70$

$= 22 \times 10 \times 70$

$= 15400$ sq cm

$\therefore$ Area of the circle is 15,400 sq cm.

Cost of painting in 100 sq cm $=$ ₹ 5

$\therefore$ Cost of painting in 15400 sq cm $=$ ₹ $\left(\dfrac{15400 \times 5}{100}\right)$

$=$ ₹ (154×5)

$=$ ₹ 770

Thus, Dineshbhai has to pay ₹ 770 for painting.

Practice 3

1. Find the area of the circle from given information :

No.	Radius (r)	Diameter (d)	Area of circle
(1)	42 cm	_____	_____
(2)	_____	14 metre	_____
(3)	1.4 cm	_____	_____
(4)	28 metre	_____	_____
(5)	35 cm	_____	_____
(6)	_____	5.6 metre	_____

2. Radius of the circular swimming pool is 70 cm. Then find the area of the bottom of the pool.

3. In a school, exactly at the middle of the stage of the assembly hall, after drawing a circle of 2.8 m radius, a beautiful picture is to draw in it. Cost for drawing is ₹ 300 per 1 sq m. What is the total cost of drawing a picture in this circle ?

4. Diameter of a circular plot is 19.6 m. Cost of levelling this plot is ₹ 50 per sq m, then find the cost of levelling the plot.

5. Diameter of a watertank is 1.4 m. Tiles have to fix in its bottom. If labour charge to fix the tiles is ₹ 60 per sq m, then find the total labour charge to fix the tiles.

- If measure of radius of a circle is given, then use the formula πr^2 to find the area of the circle.
- If measure of diameter of a circle is given, then first find out radius and then use the formula πr^2 to find the area of the circle.
- If measure of diameter of a circle is given, then to find area of a circle, $\frac{\pi d^2}{4}$ formula is also use.

Exercise

1. Fill up the following table :

No.	Radius (r)	Diameter (d)	Circumference	Area of circle
(1)	0.7 m	.....	.....	.....
(2)	.....	84 cm	.....	.....
(3)	140 metre	.....	.....	.....
(4)	4.9 cm	.....	.....	.....
(5)	.....	70 cm	.....	.....

2. Diameter of a bengle is 7 cm. Thin stripe of gold is to be fixed on this bengle, find the cost for it at the rate of ₹ 100 per 1 cm.

3. Radius of a marry-go-round is 7 m. At its edge, at equal distances swings are suspended. If length of an arc between two successive swings is 4 metre, then find the number of swings that marry-go-round has.

4. Diameter of the wheel of horse-cart is 1.40 metre. How much distance is covered by this wheel in one rotation ? How much distance is covered by this wheel in 500 rotations ? If it covers 77 km distance then find no. of turns (rotations).

5. A heritage stepwell is secured by a circular wire fence. Radius of this circle is 17.5 metre. Find the cost of fencing at the rate of ₹ 50 per metre.

6. Radius of the circular ground is 10.5 m. What is the cost to fill up this ground with soil at the rate of ₹ 150 per sq m ?

7. Radius of the circular garden is 9.1 metre. What is the cost of preparing lawn in it at the rate of ₹ 100 per 1 sq metre ?

Answer

Practice 1

1. (1) 140 cm, 440 cm (2) 7 metre, 44 metre (3) 98 m, 308 metre
(4) 7 cm, 22 cm (5) 21 metre, 132 metre (6) 2.8 cm, 17.6 cm

2. 440 cm **3.** 352 metre **4.** 13.2 cm **5.** 61.6 cm **6.** 28.6 metre

Practice 2

1. ₹ 8800 **2.** 880 metre **3.** 264 cm, ₹ 528 **4.** ₹ 66 **5.** ₹ 4180

Practice 3

1. (1) 5544 sq cm (2) 154 sq m (3) 6.16 sq cm
(4) 2464 sq m (5) 3850 sq cm (6) 24.64 metre

2. 15400 sq cm **3.** ₹ 7392 **4.** ₹ 15092 **5.** ₹ 92.4

Exercise

1. (1) 1.4 m, 4.4 m, 1.54 sq m (2) 42 cm, 264 cm, 5544 sq cm
(3) 280 metre, 880 metre, 61600 sq m (4) 9.8 cm, 30.8 cm, 75.46 sq cm
(5) 35 cm, 220 cm, 3850 sq cm

2. ₹ 2200 **3.** 11 swings **4.** 4.4 cm, 2200 cm, 17500 turns

5. ₹ 5500 **6.** ₹ 51,975 **7.** ₹ 26,026

2 Revision

1. Answer the following questions by selecting proper alternative :

(1) (–2) – (–2) = ?

(A) 0 (B) 4 (C) –2 (D) –4

(2) Arrange (–4), 3, 2, 0, (–1) in ascending order.

(A) 0, 2, 3, (–1), (–4) (B) (–4), (–1), 0, 2, 3

(C) (–1), (–4), 0, 2, 3 (D) 0, (–1), 2, 3, (–4)

(3) What is the measure of complementary angle of 12° ?

(A) 68° (B) 78° (C) 88° (D) 72°

(4) What is the measure of supplementary angle of 108° ?

(A) 76° (B) 62° (C) 72° (D) 82°

(5) What is the measure of vertically opposite angle of 71° ?

(A) 91° (B) 109° (C) 19° (D) 71°

(6) What is the HCF of 7 and 17 ?

(A) 7 (B) 1 (C) 119 (D) 17

(7) What is the LCM of 8 and 12 ?

(A) 8 (B) 12 (C) 96 (D) 24

(8) Out of the following which pair has HCF 1 ?

(A) 33 and 37 (B) 2 and 8

(C) 7 and 21 (D) 25 and 75

(9) What is the reduced form of $\frac{8}{20}$?

(A) $\frac{16}{40}$ (B) $\frac{4}{5}$ (C) $\frac{2}{5}$ (D) $\frac{2}{4}$

(10) $7\frac{1}{2} + 8\frac{1}{2} = ?$

(A) 16 (B) $15\frac{1}{2}$ (C) $5\frac{1}{2}$ (D) 15

(11) Perimetre of circle is known as

(A) Area (B) Volume (C) Diameter (D) Circumference

(12) What is the approximate ratio of circumference of a circle and its diameter ?

(A) $\frac{14}{10}$ (B) $\frac{22}{7}$ (C) $\frac{2}{7}$ (D) $\frac{7}{22}$

2. In the following questions place, proper digit in place of ? :

(1)	8	16	32	?
(2)	1	5	?	125
(3)	10	30	90	?
(4)	1	7	?	343
(5)	72	36	18	?
(6)	216	72	?	8
(7)	750	?	30	6
(8)	686	?	14	2
(9)	10,000	1000	?	10
(10)	648	108	?	3

3. Fill in the blank by placing proper digit :

3.4	×		= 34	
÷		×		
	×	0.67	=	
=		=		
0.034		6.7		

4 Arrange the following integers on the numberline and go ahead according to instructions : (Answer on numberline)

(-4) 3 (-8) 0 2 9 5 (-11)

(1) Arrange in ascending order.

(2) Arrange in descending order.

(3) Show integers between (–11) to 2 on numberline.

(4) Give result of (–8) + 2.

(5) Give result of (–4) – (–11).

5. Find the measure of complementary angle and supplementary angle of 64°.

6. If measure of one angle of linear pair is 102°, then find the measure of second angle.

7. Find HCF of following numbers :

(1) 35, 77 and 84 (2) 30 and 110 (3) 78, 96 and 108

8. Find LCM :

(1) 36 and 54 (2) 27, 54 and 81 (3) 15, 25 and 30

9. Complete the table with proper calculation :

$\frac{1}{7}$	+		=	$\frac{3}{7}$
×		×		+
$\frac{7}{9}$	÷	$\frac{14}{12}$	=	
=		=		=

10. Solve the following :

(1) 3.68 × 5 (3) 25.665 ÷ 15

(2) 5.34 × 0.03 (4) 8.4 ÷ 7

11. Mayank is 8 years old and his sister Shilpa is 12 years old, then find the ratio of both ages.

12. If 20 litre oil is fill up into 4 jars, then what is the capacity of 7 such jars ?

13. Out of 450 flowers 9 garlands are prepared of equal size, then how many garlands are prepared from such 600 flowers ?

14. 252 students take 3 hours for decorating the school. If 372 students together do this work, then this work completes in how much time ?

15. Diameter of circular ground is 98 metre. If a student walks 14 metre per minute at the edge of the ground then how much minute does he walk ?

16. On the wall of school's prayer hall, in a circle of 70 cm radius, a picture of Nature is to be drawn, if the cost of drawing is ₹ 5 per 100 sq cm, then find the total cost.

17. Radius of the sports ground is 28 metre. Find the cost of levelling the ground at the rate of ₹ 10 per sq m.

Answers

1. (1) A (2) B (3) B (4) C (5) D (6) B (7) D (8) A (9) C (10) A (11) D (12) B

2. (1) 64 (2) 25 (3) 270 (4) 49 (5) 9 (6) 24 (7) 150 (8) 98 (9) 100 (10) 18

3.

3.4	×	10	=	34
÷		×		
100	×	0.67	=	67
=		=		
0.034		6.7		

5. Complementary angle - 26°, Supplementary angle - 116°

6. Measure of another angle - 78°

7. (1) 7 (2) 10 (3) 6 **8.** (1) 108 (2) 162 (3) 150

9.

$\frac{1}{7}$	+	$\frac{2}{7}$	=	$\frac{3}{7}$
×		×		+
$\frac{7}{9}$	÷	$\frac{14}{12}$	=	$\frac{2}{3}$
=		=		=
$\frac{1}{9}$		$\frac{1}{3}$		$\frac{23}{21}$

10. (1) 18.40 (2) 0.1602 (3) 1.711 (4) 1.2

11. Ratio of age of Mayank and Shilpa is $\frac{2}{3}$. **12.** 35 litre oil **13.** Total 12 garlands

14. 2 hours **15.** 22 minute **16.** ₹ 770 **17.** ₹ 24,640

8 Introduction to Computer-1

- **What is Computer ? :**

Computer is an electronic machine. It accepts the information as 'Input' and after processing it, it gives necessary output. Because of vast use of computer, there is major change in lifestyle, working methods and to get knowledge.

- **Application of Computer :**
  - Drawing and colouring
  - Letter writing and report writing
  - Mathematical procedures
  - Formation of Cinema, animation, music etc
  - Playing games after downloading
  - Storage of informations
  - Communication through internet

Thus, computer is not a general but it is a smart machine.

Think : Where do you see computers ?

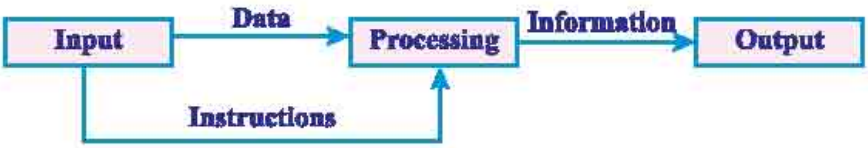
- **Characteristics of Computer :**
  - **Speed :** It processes fast. Through it, millions of mathematical operations are done in short time and thus save time.
  - **Accuracy :** It does not do any manual mistake. So, it is really accurate and trustable.
  - **Diligence :** It does not fatigue or tired after performing same work many times.
  - **Storage :** It stores every type of informations (words, digits, pictures, sounds etc.) and you can see it wherever it is necessary.
  - **Multifunctional :** It can do different types of works together. e.g. you can listen music at the time of typing a letter.

- **Remember :**

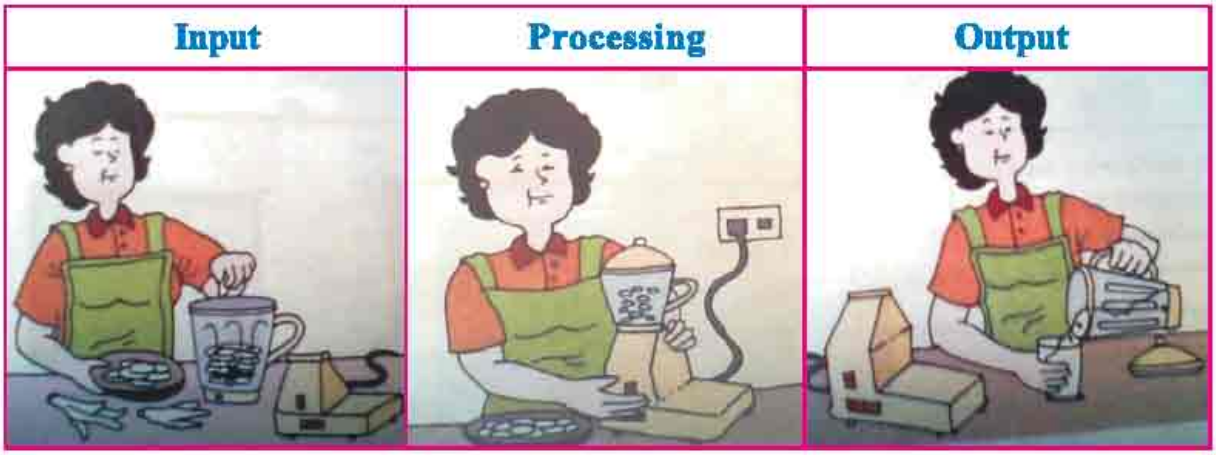
Computer has no thinking power or decision power of its own. It works according to the instructions given.

Now think : What are the difference between computer and humanbeing ?

- **How does Computer Works ? :**



- **Input :** Data or instruction given to the computer.
- **Process :** Work done on the data according to the instructions.
- **Output :** Result obtained after the process.



8.1 How Computer Works ?

- **Devices of Computer :**

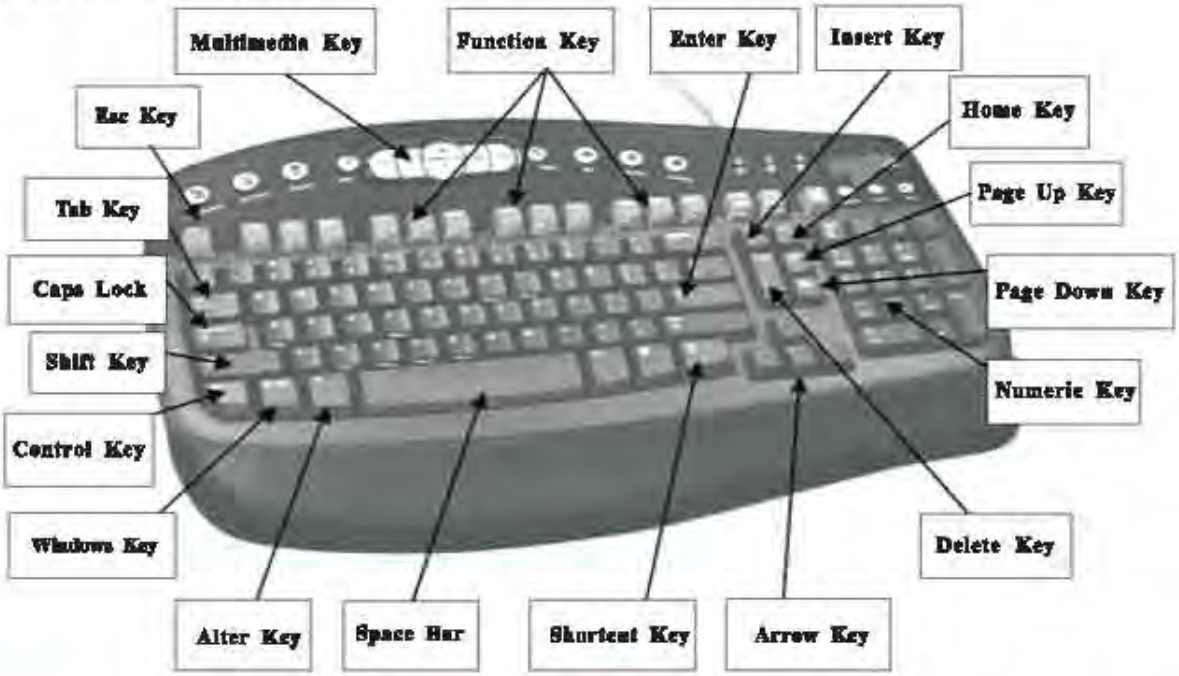
8.2 Devices of Computer

Activity : Know the use of different devices of computer in the computer laboratory, with the help of your teacher.

- **Computer is divided into main four parts :**

1. Input Device :

(1) Keyboard : Wording or statistical informations and instructions are given to the computer by the key-board.



8.3 Keyboard

Activity : Observe the key-board of computer in your computer-lab. Also observe different keys given in it and find alphabets of your name from the key-board.

(2) Mouse : Mouse is a pointing device. Three processes are done with the help of mouse.

(1) Pointing
(2) Selecting
(3) Moving

Also know about the following with the help of your teacher :

					
Microphone	Webcam	Scanner	Joy-stick	Light pen	Touch Screen

2. Processing Device :

CPU (Central Processing Unit) is Processing device. It controls all the procedures of computer.

8.4 CPU Tower

3. Output Device :

(1) Printer : Information in the computer can be printed on the paper. Three types of printers are seen.

Dot Matrix

Laserjet

Inkjet

8.5 Printers

(2) Monitor : It seems to be TV screen. We can see the given informations and its result on it. Two types of Monitors are there.

CRT (Cathode Ray Tube)

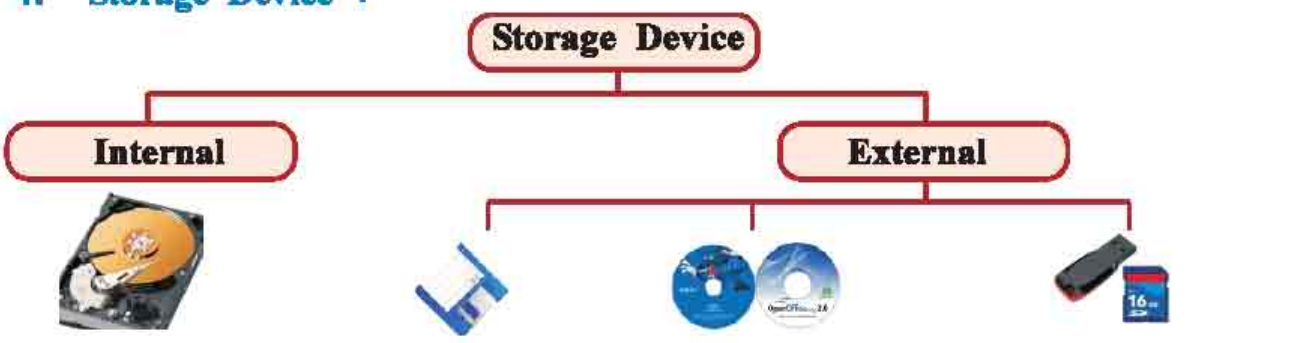
LCD / LED

(Liquid Crystal Display/Light Emitting Diode)

8.6 Monitors

Know about  and  from your teacher.

4. Storage Device :



Hard Disk

Floppy

CD / DVD

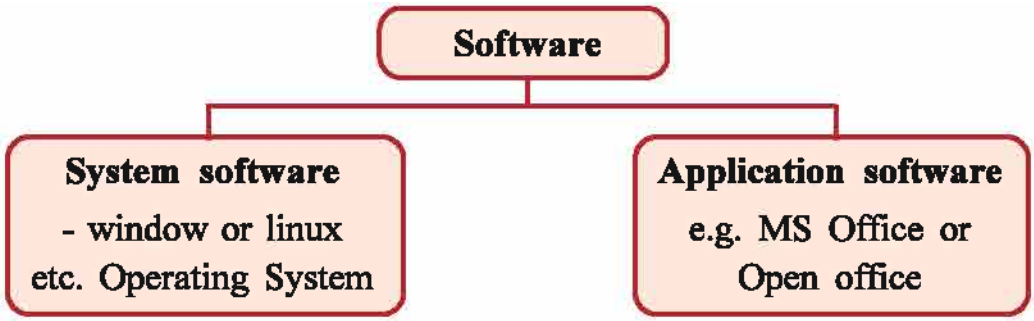
Pen drive / SD card

8.7 Storage Devices

Activity : Which parts are available of the computer in your computer lab ? Observe it and make a list.

- **Hardware / Softward :**
  - **Hardware :** The physical parts of computer, which we can see or touch is called Hardware.
  - **Software :** The group of necessary program to run the computer is called software.

CD or DVD are itself hardware but Audio/Video present in it are software. CPU is also a hardware but the different types of programs installed in it are called software.



- **Operating System :**

Operating system is such a software program that it can conduct all hardware connected with computer and also conduct other software programs. Generally when computer starts operating system runs. Linux, Windows, Ubuntu, Mac, DOS, Unix etc are the examples of it.

Without operating system computer is like body without soul. It is the orgin of all activities of the computer. Generally, when computer switch on it starts its booting activity.

- **Functions of Operating System :**
  - It can store the information in file or folder form and display again.
  - When we work on more than one program on computer then OS can decides how much priority is given to which work.
  - In can update of its own internal real time clock. Through this we can know about the time while preparing file or correction in it.
  - It can give platform to open other application.
  - It makes connection easy and arrangable between computer and its operator.

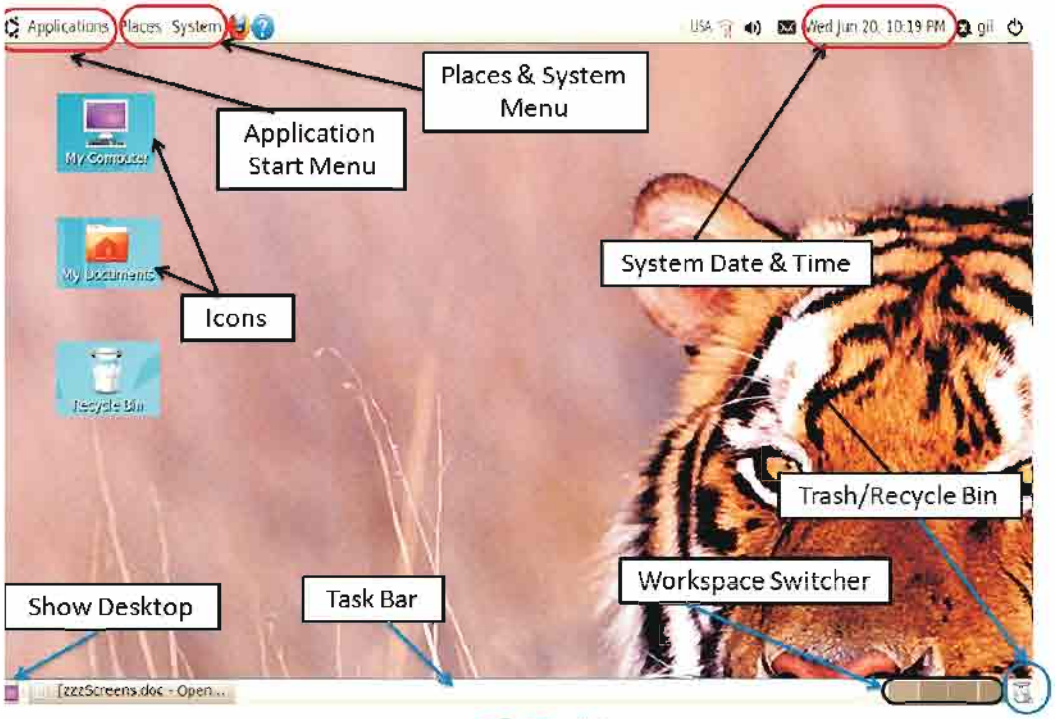
- DOS, Windows, Unix, Mac, Linux etc are the well-known operating system :
  - **Open Source Software :** Source means software or program code. Open source is a source code, which can available for all. User of open source software or application use it or make a change in it without paying charge to the manufacturer of open source software. User can also distribute to other.
  - **Linux - as an Operating System :** In the decade of 1980-1990 AD. UNIX Operating System was freeware. Linux is also UNIX based open source operating system. It is prepared by a person named Linus Torvald. Althrough world's developers also contribute in it. Linux can download in free of cost. Presently many versions of Linux are available. Like Redhat, Ubuntu, SuSE, Fedora, Boss, Debian, Gentoo etc. Presently Linux's Ubuntu Version is given to our schools.
  - **Ubuntu :** Ubuntu is Linux based operating system. 'Ubuntu' is an African word, it means 'Huminity to others'. First addition is released in 2005.

- **Advantages and Disadvantages of Linux Operating System :**

Advantages	Disadvantages
• Totally free of cost operating system. • Available in world's 61 regional languages. • Driver Files are not necessary. • It is secured.	• It is difficult to decide its modern version. • Software prepared for Window Operating System cannot works in it.

- **Desktop :**

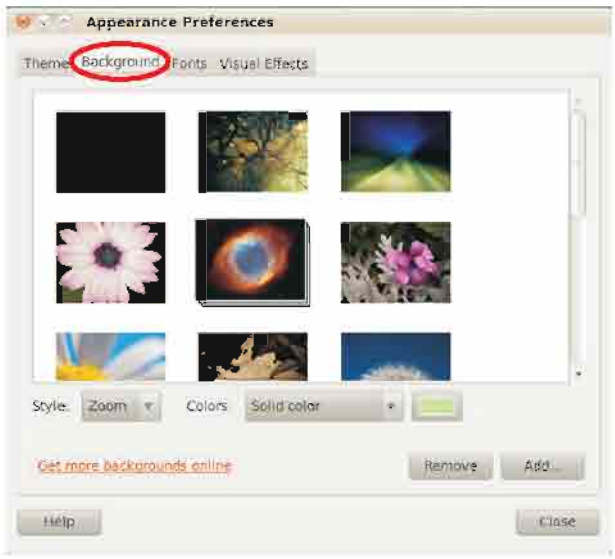
When computer starts, operating system start loading, after given the password, to enter into operating system, we can see the screen as shown in the figure, which is known as Desktop.



8.8 Desktop

Activity : Observe the Desktop after starting computer. Compare it with shown picture and discuss with your teacher.

- **Parts of Desktop :**
  - **Desktop Background & Icons :** Give right click on the Desktop, a menu is opened, now click on change Desktop, then dialogue box opens as shown in the figure.



8.9 Desktop Background

Now, from open dialog-box select a picture and click on the close button then your Desktop background will be changed.

Activity : In the same dialog-box, from the theme tab, select 'New Wave' theme and click on the close button. Then select 'Radiance' theme and click on the close button. Now what changes occur in the computer, discucss it with your teacher.

8.10 Themes

Generally, on the Desktop different pictorial Icons are there as shown in fig. 8.8. e.g. My Computer, My Document, Recycle bin etc. Through it shown programme is opened in it. Generally Icons are the shortcut to start the programme.

Activity : Open the different Icons as shown in fig 8.8 and then observe.

- **Application, Places and System Menu :**

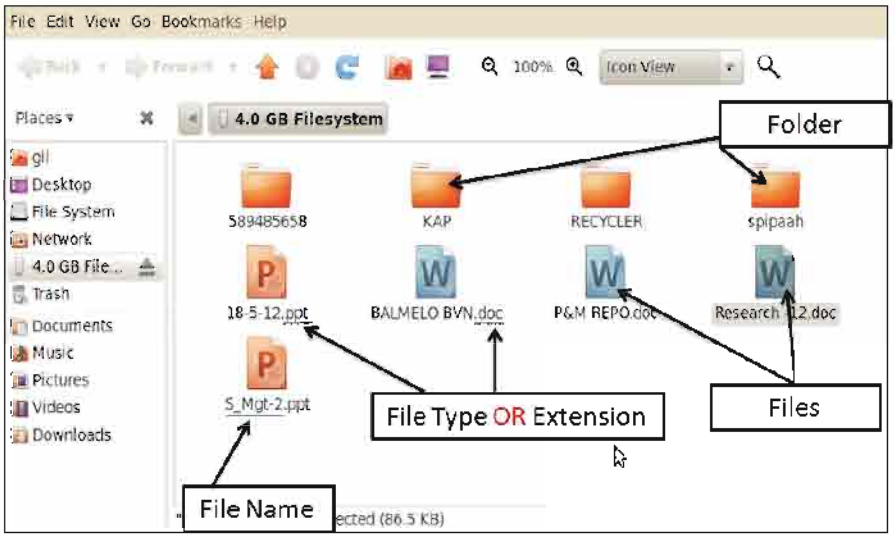
8.11 Menubar on Desktop

- Application button shows Menu-list to start different programmes.
- Places button provides alternative to move on different locations of computer. e.g. Desktop, Pictures, Document etc. Moreover server is also connected from this.
- In System Menu we can make settings of Keyboard, Mouse, Monitor, Sound, Network etc e.g we can change Monitor resolution or position by clicking on Monitor.

- **File and Folder :**
  - **File :** A collection of informations, which is stored with a definite name in the computer is called a File, according to the format of information, different types of Files are seen. It is recognize on the base of File's extension.

    e.g., Sound File : Poem7.wav

    Picture File : tiger.jpeg
  - **Folder :** Group of Files and sub-folders are called Folder.



8.12 Folders and Sub-folders

- **Operations related to File / Folder :**

  (1) Creating New Folder : To make Folder give right click on Desktop with mouse on the Desktop. From the given alternative select an alternative of Create Folder then new Folder will be form. Suitable name is given to it.

(2) **Rename :** Give right click on Folder or File, then select 'Rename' alternative you can Rename the File or Folder.

(3) **Copy / Cut / Paste :** Give right click on Folder or File and select Copy or Cut alternative, then we can Copy or Cut that Folder or File. It can Paste at another place, after right click at that place and selecting Paste alternative. If you select Cut alternative then File/Folder move from original place.

Activity : Make a Folder with your name on the Desktop. Rename it with your friend's name. Copy/Cut it and then Paste it with the instruction given by your teacher.

- **Files Browser (My Computer) :**

Double click on My Computer, File browser will open.

(8.13 File Browser)

From different place (address) of computer, stored File / Folder can be seen from here. Operations related to File / Folder like Copy, Cut, Paste, Rename etc can do from here. Generally data of the user is stored in Home Directory (Folder). Selected File / Folder can see in different format with the help of Icon View Option.

- **Application Software :**

In Accessories following Application Softwares are seen :

(1) Calculator : To do mathematical operations computer contains calculator software.

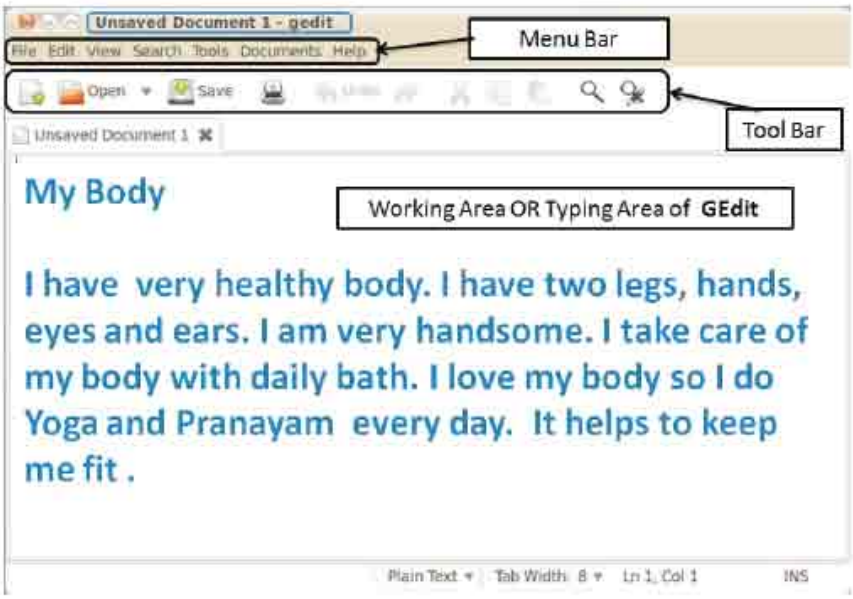
8.14 Calculator

Activity : With the help of Calculator Application do some simple mathematical operations.

- **GEdit - Text Editor :**

Application Menu → Accesories → GEdit

Create text document :



8.15 GEdit - Text Editor

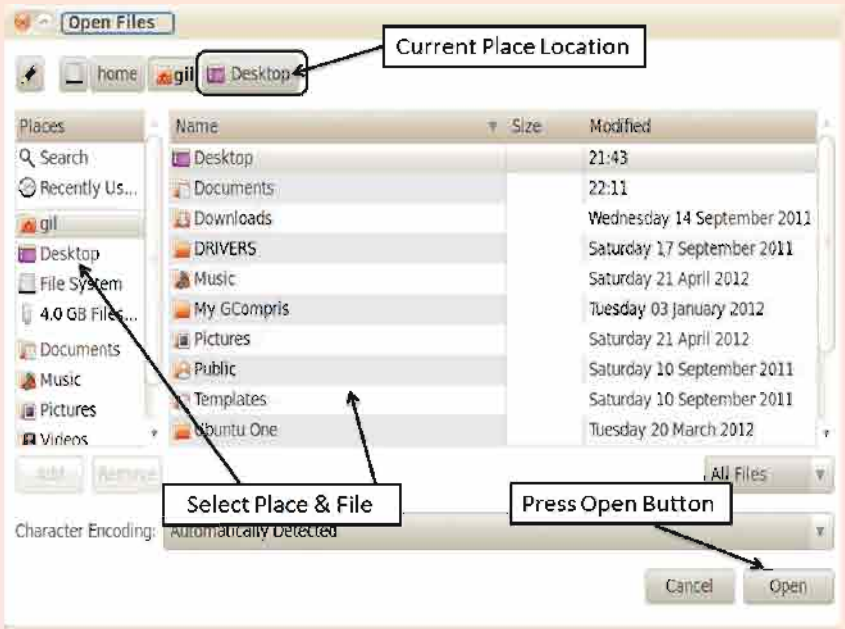
In the open window, type the paragraph as shown in the figure or given by your teacher. After that to store it in computer click on the Save button given in toolbar then a dialogue box will open as shown in the adjoining figure.

8.16 Save File

First given proper File Name to the File. After that select the place where you want to save it. Then click on the save button, so the File save as File Text Document.

Activity : Close the given program, then find the File prepared by you from File browser with the help of your teacher.

Now, open GEdit and click on the Open button of Toolbar, a dialogue box will open as shown in the following figure. Open the File which you save after selecting from its place.



8.17 Open File

- **Edit Text Document :**

For the correction in the given Document following useful commands are important :

(1) Undo : To remove the effect to last work.

(2) Redo : To obtain again the Undo matter.

(3) Copy : After Copy the selecting Text it can move it at other place.

(4) Cut : To move selecting Text at another place, by removing the same from original place.

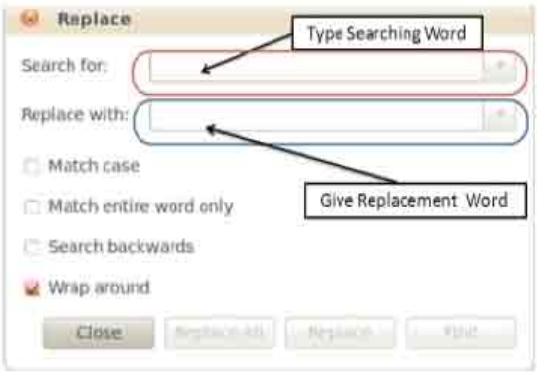
(5) Paste : To paste the data at proper place which was Copy or Cut.

Activity : Use the above command in your typed paragraph with the help of your teacher.

- **Search Menu :**

From the given paragraph, to find word or phrase very quick. Find or search command is given in the computer.

8.18 Find Dialog-box



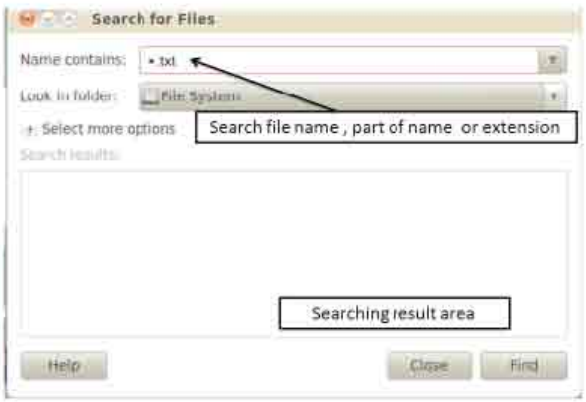
8.19 Replace Dialog-box

To change definite word or phrase with another word or phrase, Replace command is used.

- **Search for File :**

Any File in the system can be find with their name or alphabets of name or extension.

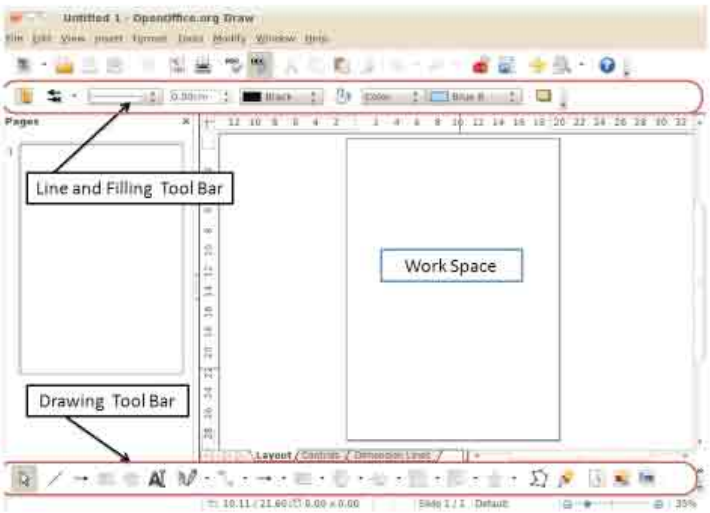
Activity : Type - Rose.jpg, P*.jpg, *home.jpg, *.text, *.* and find it.



8.20 Search for Files

- **Graphics Software :**

Application → Graphics → openoffice.org draw



8.21 Draw

Digital drawing can make with this program, also with the help of different tools given in the software, different designs can make easily and also fill up the colours.

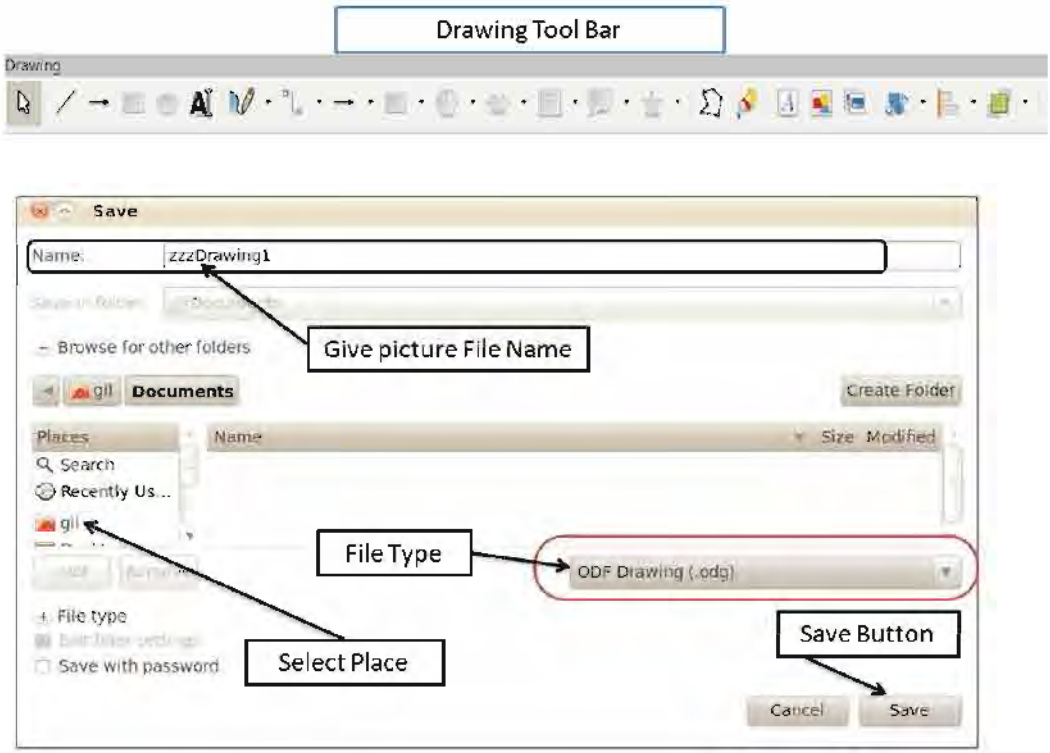
As shown in the screen, for drawing special two Toolbar are used.

(1) Drawing Toolbar : In it line, shape, object, font work, speach balloon etc tools are there.

(2) Line and Filling Toolbar : Here after selecting line and colours, it can be used.

Activity : Draw the picture from geometrical figures and fill up the colours. e.g. Kite, Temple, Home, Sun etc.

When you give Save command from File Menu or Toolbar to the drawn picture then dialogue box will open as shown in the figure. Fill up the necessary data and save it. Your picture is saved with '.odf' extension.



8.22 Save

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