

Integers :- Collection of whole numbers and negative numbers are called Integers.

Exercise :- 6.1

- K₁) (a) +10° (b) - Rs 120 (c) +2500m
 K₂) (a) Integers (b) zero (c) zero (d) 2 or I
 (e) Negative numbers.
 K₃) (a) -5°C (b) (c) +500m (d) -1000m
 S₁) (c) A loss of Rs 5
 S₂) (b) Down, 2

S₃)

Place	Temperature	Integer
Hyderabad	20° above 0°C	+20°C
Srinagar	5° below 0°C	-5°C
Dasjeelung	11° below 0°C	-11°C
Bengaluru	15° above 0°C	+15°C

A₁) -5°C

A₂) (a) 35m, -40m (b) 10, -20 (c) 5°C, -6°C

A₃) Height of Mt. Everest = +29,035 feet

Depth of Mariana Trench = -36,070 feet

A₄) Temperature in Shimla in morning = +15°C

Temperature in Shimla in the Afternoon = +20°C

A₅) The temperature closest to 0°C is -1°C.

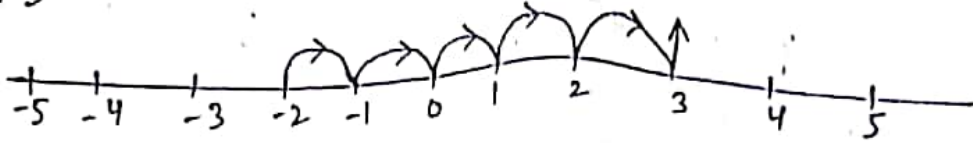
(c) increases.

K₁) (a) left (b) zero

K₂) (a) -2



(b) 3



(c) -5

K₃) (a) 124

(b) -352

(c) 97

(d) -726

(e) 425

(f) -625

K₄) (a) 252

(b) 306

(c) -107

(d) -924

(e) 300

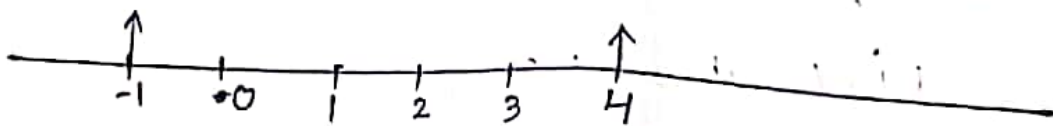
(b) -23

K₅) No.

Smallest 4-digit number = 1000

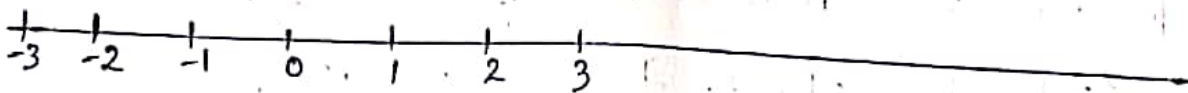
Successor of Smallest 4-digit number =
$$\begin{array}{r} 1000 \\ + 1 \\ \hline 1001 \end{array}$$

S₁)



⇒ All the integers between -1 and 4 are 0, 1, 2, 3.

S₂)



⇒ All the integers that are greater than -3 but smaller than 3 are -2, -1, 0, 1, 2.

S3)



(a) > (b) > (c) > (d) <

S4) (a) Decrease in length by 20m.

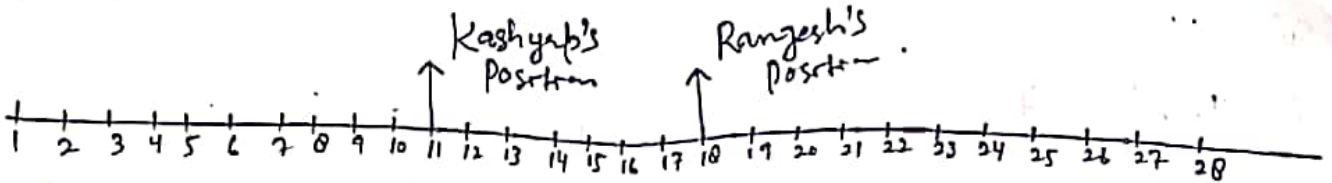
(b) Profit of Rs 200

(c) 500 m west

(d) +132

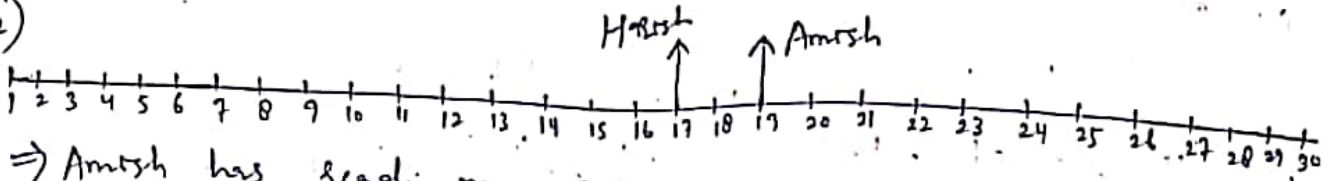
(e) -3131

A1)



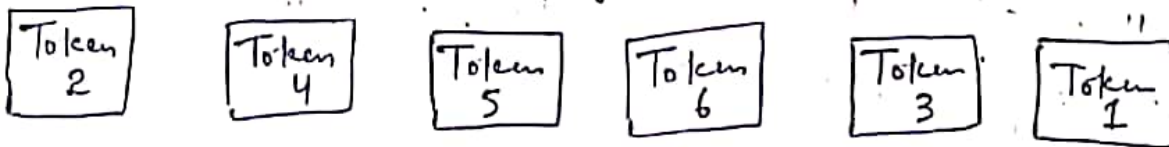
⇒ No. of students standing between Kashyap and Rangesh = 6 students.

A2)



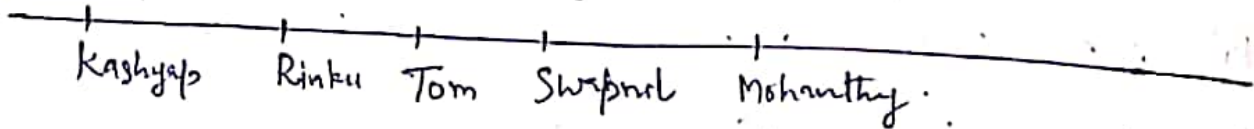
⇒ Amrsh has read more pages.

A3)



⇒ The successor of Token 2 is Token 4.

A4)



Exercise 1-6.3

K1) (a) absolute (b) Sym (c) $|a| = a$

K2) (a) $|15| = 15$ (b) $|-12| = 12$ (c) $|8| = 8$
(d) $|17| = 17$

S1) (a) = (b) < (c) = (d) <

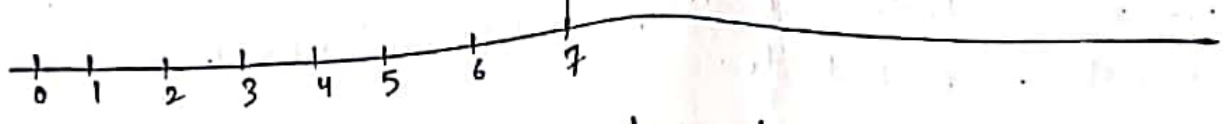
S2) (c) $-|-3| = -3$

S3) -2

S4) 3

A1) $|-7| = 7$

absolute value of -7



A2) The doll on the number line is at -5. It is at a distance of five steps from zero.

A3) $|11|, -15, |-17|, |22|, -19, |-20|, |14|$
 $11, -5, 17, 22, -19, 20, 14$

descending order:-

$20 > 22 > 17 > 14 > 11 > -5 > -19$

Exercise 1-6.4

K1) (a) F (b) T (c) F (d) T (e) F (f) F

K2) (a) < (b) > (c) < (d) <

K3) (i) $|-10|, -15, |-3|, |17|, |-21|, -11, |9|$
 $10, -5, -3, 17, 21, -11, 9$

Ascending order:-

$-11 < -5 < -3 < 9 < 17 < 10 < 21$

(ii) $148, -18, -152, -125, -17, -5$
 $48, -18, -52, -25, -17, -5$

Descending order:-

$48 > -5 > -17 > -18 > -25 > -52$

9) (a) $7 > 2 > 1 > 0 > -2 > -3$

(b) -1

(c) -7

S₂)

Integers	Ascending order	Descending order
7 and 12	$8 < 9 < 10 < 11$	$11 > 10 > 9 > 8$
-5 and 2	$-4 < -3 < -2 < -1 < 0 < 1$	$1 > 0 > -1 > -2 > -3 > -4$
-18 and 1	$-17 < -16 < -15 < -14 < -13 < -12 < -11 < -10 < -9 < -8 < -7 < -6 < -5 < -4 < -3 < -2 < -1 < 0$	$0 > 1 > 2 > 3 > 4 > 5 > 6 > 7 > 8 > 9 > 10 > 11 > 12 > 13 > 14 > 15 > 16 > 17$

S₃)

	12	-6	-15	7
10	<	>	>	>
-9	<	<	>	<
4	<	>	>	<
-3	<	>	>	<
5	<	>	>	<

S₄)

Integers	Ascending order	Descending order
$-18, 10, 0, -14, -5, -4$	$-18 < -14 < -5 < -4 < 0 < 10$	$10 > 0 > -4 > -5 > -14 > -18$
$16, 14, -11, 4, -16, -1$	$-16 < -11 < -1 < 4 < 14 < 16$	$16 > 14 > 4 > -1 > -11 > -16$
$23, -35, 17, -42, 9, -51$	$-51 < -42 < -35 < 9 < 17 < 23$	$23 > 17 > 9 > -35 > -42 > -51$

A1) • -100m

- -3m
- +60m
- +80m

Ascending order = $-100m < -3m < +60m < +80m$.

A2) Diver is closer to the surface of the sea.

A3) $50 > -0 > -37 > -70$

Exercise :- 6.5

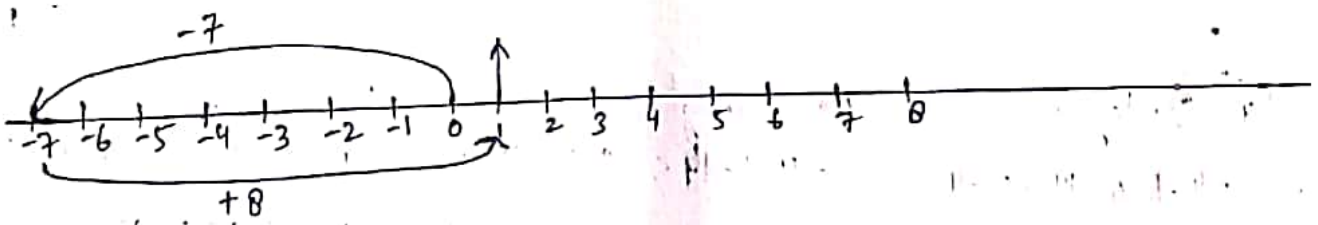
k1) a) $(+9) + (+5) = \underline{\hspace{2cm}}$
 $+9 + 5 = 14$

c) $(-7) + (-5) = \underline{\hspace{2cm}}$
 $-7 - 5 = -12$

e) $(-3) + 2 = \underline{\hspace{2cm}}$
 $-3 + 2 = -1$

- k2) • $3 - 6 = -3$
 • $2 - 6 = -4$
 • $7 - 12 = -5$
 • $-7 + 12 = 5$
 • $-3 + 0 - 12 = -12$

k3) a) $(-7) + (+0) = 1$



• (b), (c), (d), (e) Do Yourself.

S₁)

+	-5	10	7	-8	-11
-7	-12	3	0	-15	-18
29	24	39	36	21	18
16	11	26	23	8	-5
-23	-20	-13	-16	-31	-34
-1	-6	9	6	-9	-12
0	-5	10	7	-8	-11

S₂)

Integers	Additive Inverse	Integers	Additive Inverse
39	-39	47	-47
-87	87	-56	56
-36	36	-98	98

S₃) $6 - 11 + 9 - 13$

A₁) Distance covered by bus from Nagpur towards east = 60 km
 Distance covered by bus towards west = 80 km
 $\Rightarrow 80 \text{ km} - 60 \text{ km} = 20 \text{ km}$

Hence the bus is 20 km far from Nagpur.

A₂) Marbles scored by Ravi in five successive rounds = 24, 45, -10, -5, 10

\Rightarrow Total marbles scored by Ravi

$$= 24 + 45 + (-10) + (-5) + 10$$

$$= 24 + 45 - 10 - 5 + 10$$

$$= 79 - 15 = 64$$

A₃) Total money deposited by Tom in his bank account = Rs 2500

Money Tom withdraws = Rs 1250

\Rightarrow Money left in Tom's account = Rs 2500 - Rs 1250
 = Rs 1250

A4) $9 \text{ feet} - 3 \text{ feet}$
 $= 6 \text{ feet}$
 \Rightarrow Pollution goes 6 feet under water

Exercise:- 6.6

K1) (a) $(+7) - (+5) = \underline{\quad}$
 $+7 - 5 = 2$

(b) $(+3) - (-5) = \underline{\quad}$
 $+3 + 5 = 8$

(c) $(-7) - (+3) = \underline{\quad}$
 $-7 - 3 = -10$

(d) $(-1) - (-8) = \underline{\quad}$
 $-1 + 8 = 7$

(e) $(-3) - (+2) = \underline{\quad}$
 $-3 - 2 = -5$

(f) $(+7) - (-10) = \underline{\quad}$
 $+7 + 10 = 17$

K2) • $4 - 6 = -2$
 • $-3 - 6 = -9$

K3) (a) $(-5) - (+8)$
 $-5 - 8 = -13$

(b) $(+5) - (-3)$
 $+5 + 3 = 8$

• (c), (d), (e) do yourself

S1)

-	-2	11	-17	-16	1	-	-2	11	-17	-16	1
-3	-1	-14	14	13	-4	-21	-19	-32	-3	-5	-22
19	21	8	36	35	18	-11	-9	0	6	5	-12
24	26	13	41	40	23	10	12	-1	27	26	9

S2) $6 - 11 + 9 - 12$

S3) $(+3) - (-2) - (+2)$
 $= +3 + 2 - 2$
 $= 5 - 2 = 3$

(19)

A1) Temperature at noon = 5°C
Temperature at midnight = -3°C
 \Rightarrow Fall in Temperature at midnight = $5^{\circ}\text{C} - (-3^{\circ}\text{C})$
 $= 5^{\circ}\text{C} + 3^{\circ}\text{C}$
 $= 8^{\circ}\text{C}$

A2) Vertical Distance between point A and point B
 $= 1890\text{m} + 62\text{m}$
 $= 1952\text{m}$

A3) Deepest point in a sea = 950m (below the sea level)

Mountain peak = 420m (above the sea level)

\Rightarrow Difference in distance between the two
 $= 420 - (-950) = 420 + 950$
 $= 1370\text{m}$

A4) Sum of two integers = -256

One integer = 45

According to question,

$45 + \text{other integer} = -256$

\Rightarrow other integer = $-256 - 45$

\Rightarrow other integer = -301

Chapter 1 - Fractions
Chapter No: 07 (Seven)

Fraction:- A number representing a part of a whole is called a fraction.

Types of Fractions:-

- ① Proper Fractions:- Fractions whose values are less than 1 are called proper fractions. e.g. $\frac{5}{20}$, $\frac{8}{28}$
- ② Improper Fractions:- Fractions whose values are greater than 1 are called Improper fractions. e.g. $\frac{13}{11}$, $\frac{5}{2}$.
- ③ Unit Fractions:- Fractions that have 1 as numerator are called Unit fractions e.g. $\frac{1}{6}$, $\frac{1}{2}$.
- ④ Like Fractions:- Fractions that have same denominator are called like fractions e.g. $\frac{5}{20}$, $\frac{8}{20}$, $\frac{6}{20}$.
- ⑤ Unlike Fractions:- Fractions that have different denominators are called unlike fractions e.g. $\frac{2}{3}$ and $\frac{5}{9}$.

Mixed Fractions:- Fractions that consist of a whole number and a fractional part are called mixed fractions. e.g. $3\frac{5}{3}$, $8\frac{5}{7}$.

Decimal Fractions:- Fractions whose denominators are equal to powers of 10 are called decimal fractions. e.g. $\frac{1}{10}$, $\frac{37}{100}$, $\frac{523}{1000}$

Equivalent Fractions:- Different fractions having the same value are known as equivalent fractions e.g. $\frac{2}{6}$, $\frac{3}{9}$, $\frac{4}{12}$

Exercise 1: 7.11

k₁) (a) $\frac{4}{5}$ (b) $\frac{2}{4}$ (c) $\frac{3}{4}$ (d) $\frac{6}{8}$ (e) $\frac{9}{12}$
(f) $\frac{2}{7}$

k₂) (a) proper fraction (b) Improper fraction
(c) mixed fraction (d) mixed fraction
(e) Improper fraction

k₃) (a) like fractions (b) Unlike fractions
(c) Unlike fractions (d) like fractions

k₄) (a) $1\frac{1}{2}$ (b) $\frac{21}{5}$ (c) $2\frac{1}{3}$ (d) $\frac{47}{9}$ (e) $1\frac{3}{5}$
(f) $1\frac{3}{7}$

s₁) $\frac{6}{8}$

s₂) $\frac{3}{8}$, $\frac{2}{8}$ [They represent like fractions]

s₃) $2\frac{4}{10} = \frac{24}{10}$

A₁) $x = \frac{2}{3}$, $y = \frac{5}{6}$

$x = \frac{2}{3} \times \frac{6}{6} = \frac{12}{18}$

$y = \frac{5}{6} \times \frac{3}{3} = \frac{15}{18}$

$\Rightarrow y > x$

\Rightarrow Athlete B covers more distance.

A2) Pizza eaten by Rahul = $\frac{4}{12}$

Pizza eaten by Mohan = $\frac{6}{12}$

⇒ Fractions of the whole Pizza eaten by each
 $= \frac{4}{12} + \frac{6}{12} = \frac{4+6}{12} = \frac{10}{12}$

A3) Paint used by the painter to paint a house = $2\frac{2}{5} = \frac{12}{5}$

A4) Pieces of Chocolate Reena has = 12

No. of Pieces in a Chocolate bar = 5

⇒ No. of Chocolate bars Reena has = $\frac{12}{5} = 2\frac{2}{5}$

Exercise :- 7.2

K1) (a) $\frac{5}{7}$

Three equivalent fractions are:-

$\frac{5}{7} \times \frac{2}{2} = \frac{10}{14}$

$\frac{5}{7} \times \frac{3}{3} = \frac{15}{21}$

$\frac{5}{7} \times \frac{4}{4} = \frac{20}{28}$

(b) $\frac{3}{8}$

Three equivalent fractions are:-

$\frac{3}{8} \times \frac{2}{2} = \frac{6}{16}$

$\frac{3}{8} \times \frac{4}{4} = \frac{12}{32}$

$\frac{3}{8} \times \frac{3}{3} = \frac{9}{24}$

• (c), (d), (e), (f) Do Yourself.

$$k_3) (a) \frac{2}{9} = \frac{14}{[63]}$$

$$(b) \frac{7}{12} = \frac{[21]}{36}$$

(15)

$$(c) \frac{5}{9} = \frac{25}{[45]}$$

$$(d) \frac{[3]}{3} = \frac{8}{12}$$

$$(e) \frac{5}{[6]} = \frac{20}{24}$$

$$(f) \frac{[9]}{8} = \frac{28}{32}$$

$$k_4) \frac{3}{8} \times \frac{6}{6} = \frac{18}{48} \quad (\Rightarrow 18 = \text{numerator})$$

S₁) (a) and (b) are equivalent fractions of each other.

S₂) Twelve boxes should be shaded to denote a fraction equivalent to the one represented by the coloured stars. [i.e. $\frac{6}{10} = \frac{12}{20}$]

$$S_3) \frac{(3+2)}{(2+6)} = \frac{25}{40}$$

A₁) No. of marbles Tarun has = 14

Marbles Tarun gave to Ankush = 6.

\Rightarrow Fraction of marbles given to Ankush = $\frac{6}{14}$

Marbles left = $14 - 6 = 8$.

No. of more marbles Tarun buys = 13

\Rightarrow Total no. of marbles Tarun has = $13 + 8 = 21$

\Rightarrow Fraction of marbles given to Ankush such that it is equivalent to the fraction of marbles given earlier = $\frac{9}{21}$ [Because $\frac{6}{14} = \frac{9}{21}$]

\Rightarrow No. of marbles given to Ankush = 9 marbles.

A2) Yes,

$$\text{because } \frac{12}{3 \cdot 10} = \frac{6^2}{24} = \frac{16}{24} = \frac{2}{3} \Rightarrow \frac{2}{3} = \frac{2}{3}$$

A3) Yes,

$$\text{because } \frac{2}{5} = \frac{6^2}{15 \cdot 5}$$

Exercise 7.3

K1) (a) $\frac{4}{5}$

(b) $\frac{5}{7}$

(c) $\frac{4}{9}$

$$(a) \frac{2}{3} \times \frac{5}{5} = \frac{10}{15} \Rightarrow \frac{2}{3} > \frac{3}{5}$$

$$\frac{3}{5} \times \frac{3}{3} = \frac{9}{15}$$

$$(b) \frac{3}{4} \times \frac{7}{7} = \frac{21}{28} \Rightarrow \frac{3}{4} > \frac{4}{7}$$

$$\frac{4}{7} \times \frac{4}{4} = \frac{16}{28}$$

(F) Do Yourself

K2) (a) $\frac{5}{6} \quad \frac{3}{4}$

$$\frac{5}{6} \times \frac{4}{4} \quad \frac{3}{4} \times \frac{6}{6}$$

$$\frac{20}{24} > \frac{18}{24}$$

$$\Rightarrow \frac{5}{6} > \frac{3}{4}$$

(b) $\frac{5}{12} < \frac{7}{12}$

(c) $\frac{1}{3} \quad \frac{4}{5}$

$$\frac{1}{3} \times \frac{5}{5} \quad \frac{4}{5} \times \frac{3}{3}$$

$$\frac{5}{15} < \frac{12}{15}$$

$$\Rightarrow \frac{1}{3} < \frac{4}{5}$$

(d), (e), (f) Do Yourself

(15)

$$K3) (a) \frac{1}{7} < \frac{2}{7} < \frac{3}{7} < \frac{4}{7} < \frac{5}{7} < \frac{6}{7}$$

$$(b) \frac{1}{4} \times \frac{2}{2} = \frac{2}{8}$$

$$\frac{3}{8} \times \frac{1}{1} = \frac{3}{8} \Rightarrow \frac{2}{8} < \frac{3}{8} < \frac{4}{8} < \frac{5}{8} < \frac{6}{8}$$

$$\frac{1}{2} \times \frac{4}{4} = \frac{4}{8} \Rightarrow \frac{1}{4} < \frac{3}{8} < \frac{1}{2} < \frac{5}{8} < \frac{3}{4}$$

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

$$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$$

S1) Do Yourself

$$S2) \frac{7}{8} < \frac{(2 + \frac{5}{7})}{7}$$

$$\frac{7}{8} \times \frac{7}{7} < \frac{(2 + \frac{5}{7})}{7} \times \frac{8}{8}$$

$$\frac{49}{56} < \frac{(7) \times 8}{56}$$

$$\frac{49}{56} < \frac{56}{56}$$

S3) Do Yourself

A1) Fraction of cart 'A' loaded with cartons = $\frac{5}{6}$

Fraction of cart 'B' loaded with cartons = $\frac{6}{9}$

\Rightarrow Cart 'A' is heavier because

$$\frac{5}{6} \times \frac{9}{9} = \frac{45}{54} \text{ and } \frac{6}{9} \times \frac{6}{6} = \frac{36}{54}$$

$$\frac{45}{54} > \frac{36}{54}$$

(16)

A2) Fraction of points scored by Tarun = $\frac{7}{10}$
Fraction of points scored by Meena = $\frac{8}{12}$

As, $\frac{7}{10} \times \frac{12}{12} = \frac{84}{120}$ and $\frac{8}{12} \times \frac{10}{10} = \frac{80}{120}$.

\Rightarrow Tarun score greater.

A3) Length of Red Ribbon = $2\frac{4}{5}$ m = $\frac{14}{5}$ m.

Length of blue Ribbon = $3\frac{1}{6}$ m = $\frac{19}{6}$ m.

As, $\frac{14}{5} \times \frac{6}{6} = \frac{84}{30}$ and $\frac{19}{6} \times \frac{5}{5} = \frac{95}{30}$

\Rightarrow Blue Ribbon is longer.

A4) No. of pages read by Pooja on Wednesday = $\frac{1}{9}$

No. of pages read by Pooja on Thursday = $\frac{2}{3}$

No. of pages read by Pooja on Friday = $\frac{2}{9}$

As, $\frac{1}{9} \times \frac{1}{1} = \frac{1}{9}$; $\frac{2}{3} \times \frac{3}{3} = \frac{6}{9}$ and $\frac{2}{9} \times \frac{1}{1} = \frac{2}{9}$

$$\Rightarrow \frac{1}{9} < \frac{2}{9} < \frac{6}{9}$$

$$\Rightarrow \frac{1}{9} < \frac{2}{9} < \frac{2}{3}$$

\Rightarrow Wednesday < Friday < Thursday.

Exercise 7.4

$$\begin{aligned} \text{K1) (a)} \quad & \frac{6}{15} + \frac{2}{15} \\ & = \frac{6+2}{15} \\ & = \frac{8}{15} \end{aligned}$$

$$\begin{aligned} \text{(b)} \quad & \frac{2}{8} + \frac{5}{8} \\ & = \frac{2+5}{8} \\ & = \frac{7}{8} \end{aligned}$$

$$\begin{aligned} \text{(c)} \quad & \frac{6}{15} + \frac{2}{5} \\ & \frac{6}{15} \times \frac{1}{1} = \frac{6}{15} \\ & \frac{2}{5} \times \frac{3}{3} = \frac{6}{15} \\ \Rightarrow & \frac{6}{15} + \frac{6}{15} \\ & = \frac{6+6}{15} = \frac{12}{15} \end{aligned}$$

• (d) do yourself.

$$\begin{aligned} \text{(e)} \quad & 2\frac{3}{10} + 1\frac{2}{5} \\ & \frac{(2 \times 10) + 3}{10} + \frac{(1 \times 5) + 2}{5} \\ & \frac{23}{10} + \frac{7}{5} \end{aligned}$$

$$\frac{23}{10} \times \frac{1}{1} = \frac{23}{10}$$

$$\frac{7}{5} \times \frac{2}{2} = \frac{14}{10}$$

$$\begin{aligned} \Rightarrow & \frac{23}{10} + \frac{14}{10} \\ & = \frac{23+14}{10} = \frac{37}{10} \end{aligned}$$

$$\begin{aligned} \text{(f)} \quad & 3\frac{1}{5} + 1\frac{1}{4} \\ & \frac{(3 \times 5) + 1}{5} + \frac{(1 \times 4) + 1}{4} \\ & \frac{16}{5} + \frac{5}{4} \end{aligned}$$

$$\frac{16}{5} \times \frac{4}{4} = \frac{64}{20}$$

$$\frac{5}{4} \times \frac{5}{5} = \frac{25}{20}$$

$$\begin{aligned} \Rightarrow & \frac{64}{20} + \frac{25}{20} \\ & = \frac{64+25}{20} = \frac{89}{20} \end{aligned}$$

$$k_3) (a) x + \frac{1}{x}$$
$$\text{put } x = 2$$

$$= \frac{2+1}{1 \cdot 2} = \frac{4+1}{2} = \frac{5}{2}$$

$$(c) x + \frac{1}{x}$$
$$\text{put } x = 4$$

$$= \frac{4+1}{1 \cdot 4} = \frac{16+1}{4} = \frac{17}{4}$$

$$s_1) \frac{1}{4} + \frac{1}{3}$$
$$= \frac{3+4}{12} = \frac{7}{12}$$

$$s_2) \frac{2}{5} - \frac{1}{4}$$
$$= \frac{8-5}{20} = \frac{3}{20}$$

$$s_3) (a) \frac{2}{3} + \frac{1}{6} + \text{---} = \frac{23}{24}$$

$$\frac{12+3}{18} + \text{---} = \frac{23}{24}$$

$$\frac{15}{18} + \text{---} = \frac{23}{24}$$

$$\text{---} = \frac{23}{24} - \frac{15}{18}$$

$$(b) x + \frac{1}{x}$$
$$\text{put } x = 3$$

$$= \frac{3+1}{1 \cdot 3} = \frac{9+1}{3} = \frac{10}{3}$$

$$(d) x + \frac{1}{x}$$
$$\text{put } x = 5$$

$$= \frac{5+1}{1 \cdot 5} = \frac{25+1}{5} = \frac{26}{5}$$

$$\frac{\quad}{\quad} = \frac{69 - 60}{72}$$

$$\frac{\quad}{\quad} = \frac{9}{720}$$

$$= \frac{1}{80}$$

$$\begin{array}{r|l} 2 & 24, 18 \\ \hline 3 & 12, 9 \\ \hline 2 & 4, 3 \\ \hline 2 & 2, 3 \\ \hline 3 & 1, 3 \\ \hline & 1, 1 \end{array} \quad (19)$$

$$\Rightarrow \frac{2}{3} + \frac{1}{6} + \frac{1}{8} = \frac{23}{24}$$

• (b) Do yourself.

A1) Amount of time Ananya studied on Friday = $\frac{3}{2}$ hours.

Amount of Time Ananya studied on Saturday = $2\frac{1}{2}$ hours = $\frac{5}{2}$ hours.

Amount of time Ananya studied on Sunday = $\frac{2}{3}$

\Rightarrow Total amount of time she had spent in studying over the three days

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

$$= \frac{9 + 15 + 4}{6}$$

$$= \frac{28}{6} \text{ hours}$$

$$\begin{array}{r|l} 2 & 2, 2, 3 \\ \hline 3 & 1, 1, 3 \\ \hline & 1, 1, 1 \end{array}$$

A2) Total kg's of flour = $4\frac{7}{16} = \frac{73}{16}$

kg's of flour taken out = 3

\Rightarrow weight of remaining flour

$$= \frac{73}{16} - \frac{3}{1}$$

$$= \frac{73 - 48}{16}$$

$$= \frac{25}{16} \text{ kg.}$$

A3) Length of the new rope = $1\frac{1}{3} \text{ m} + 2\frac{3}{4} \text{ m} + 3\frac{4}{5} \text{ m}$

$$= \frac{4}{3} \text{ m} + \frac{11}{4} \text{ m} + \frac{19}{5} \text{ m}$$

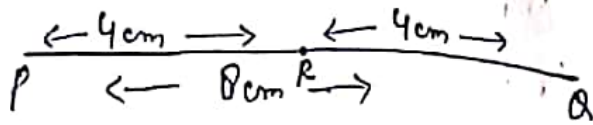
$$= \frac{4}{3} + \frac{11}{4} + \frac{19}{5}$$

$$= \frac{80 + 165 + 220}{60}$$

$$= \frac{473}{60} = 7\frac{53}{60} \text{ m.}$$

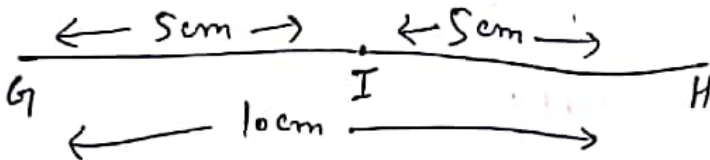
Exercise :- 5.2

k₁)



R lies between points P and A.

k₂)



Verification :- $GH = 10\text{cm}$

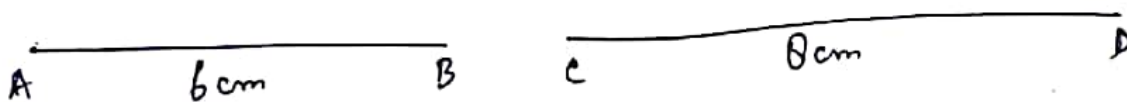
$$GI = 5\text{cm}, \quad IH = 5\text{cm}$$

$$\Rightarrow GI + IH = GH$$

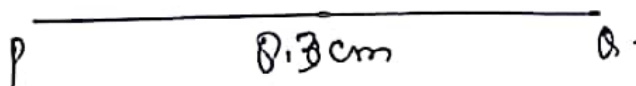
k₃) 6.8 cm.

k₄) 0.3 cm

S₁) Three line segments less than 10 cm in length are:



S₂)

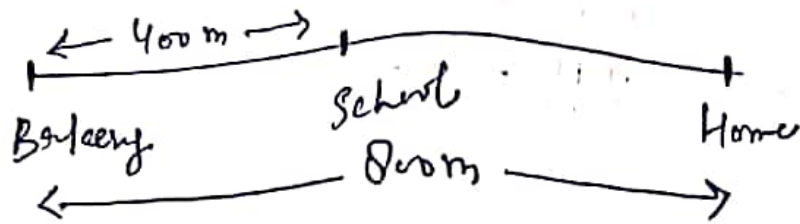


S₃)



$$\begin{aligned} \text{Difference} &= QP - XY \\ &= 7\text{cm} - 5\text{cm} = 2\text{cm} \end{aligned}$$

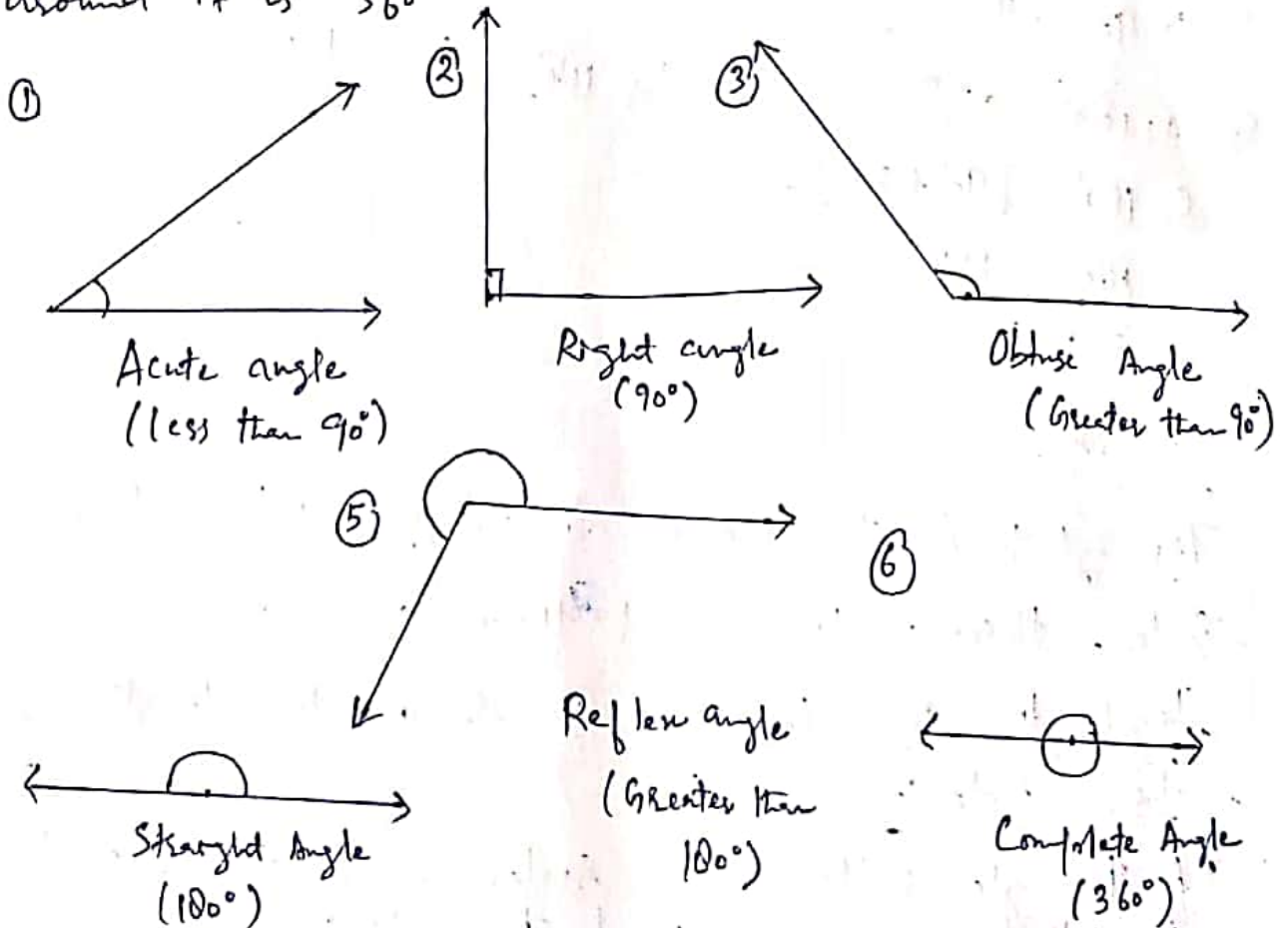
S6) Distance from school to Bakery = 400 m
Distance from Bakery to home = 800 m.



Angle:- A shape formed by two lines or rays (23) diverging from a common point (vertex) is known as Angle.

Types of Angles:-

- ① Acute angle:- An angle greater than 0° but less than 90° is called an acute angle.
- ② Right Angle:- An angle measuring 90° is called a right angle.
- ③ Obtuse angle:- An angle greater than 90° but less than 180° is called an obtuse angle.
- ④ Straight angle:- An angle included by a straight line measures 180° and is called a straight angle.
- ⑤ Reflex angle:- An angle greater than 180° but less than 360° is called a reflex angle.
- ⑥ Complete angle:- The angle included by a point around it is 360° .



- The sum of an angle and its complementary angle is 90° .
- The sum of an angle and its supplementary angle is 180° .

Exercise 5.2

K1) (a) acute (b) obtuse (c) Reflex

K2) (a), (d), (e) are acute angles.

K3) Right angle.

K4) Reflex angle.

K5) Straight angle.

S1) (a) Straight angle
(d) acute angle

(b) Reflex angle (c) Obtuse angle
(e) Complete angle (f) Right angle

S2) East direction.

S3) 3

S4) (a) $90^\circ - 65^\circ = \underline{25^\circ}$

(b) $90^\circ - 34^\circ = \underline{56^\circ}$

(c) $90^\circ - 40^\circ = \underline{50^\circ}$

(b) $180^\circ - 60^\circ = \underline{120^\circ}$

S5) (a) $180^\circ - 53^\circ = \underline{\quad}$

(c) $180^\circ - [90^\circ + 32^\circ] = \underline{\quad}$

$180^\circ - 122^\circ$
 $= \underline{58^\circ}$

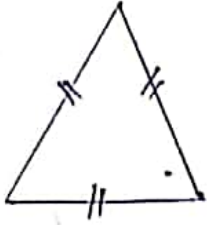
Definitions:-

Triangle - A triangle is a polygon with three sides, three vertices and three angles.

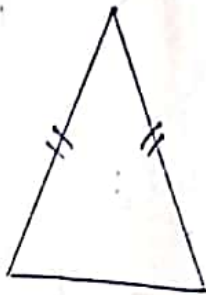
Classification of Triangles Based on the length of their sides:-

- A triangle with equal sides and equal angles is called an equilateral triangle.

- A triangle in which two of the sides are equal in length is called an isosceles triangle.
- A triangle in which all the sides are of different lengths is called a scalene triangle.



Equilateral Triangle



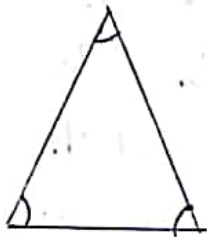
Isosceles Triangle



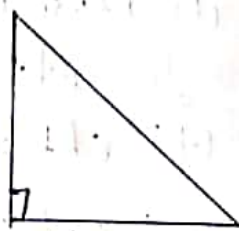
Scalene Triangle

Classification of Triangles Based on the Measurement of their Angles:

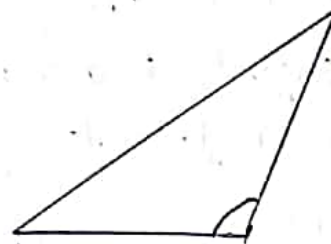
- A triangle in which all the angles are less than 90° is called an acute-angled triangle.
- A triangle in which one of the angles is equal to 90° is called a right-angled triangle.
- A triangle in which one of the angles is greater than 90° is called an obtuse-angled triangle.



Acute-angled Triangle



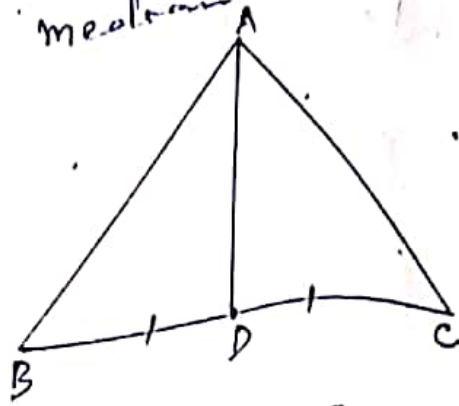
Right angled Triangle



Obtuse angled Triangle

- The sum of the three angles of a triangle is equal to 180° .

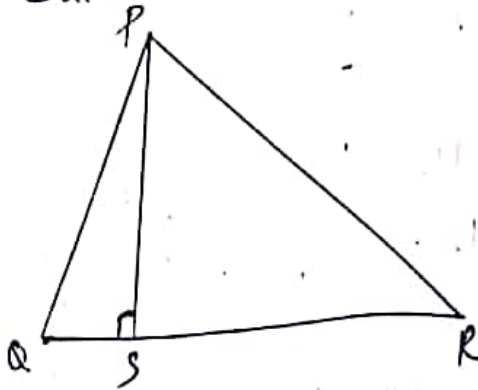
- Median:- In a triangle, the line segment joining a vertex and the mid point of the opposite side is called a median.



Mid point of BC = D

Median = AD

- Altitude of a triangle:- In a triangle, the perpendicular line segment drawn from a vertex to the opposite side is called the altitude of the triangle.



$PS \perp QR$

Exercise :- 5.3

K₁) (a) one (b) Median (c) Altitude

K₂) (a) Equilateral triangle (b) Isosceles triangle
 (c) Right angled isosceles triangle (d) Scalene triangle
 (e) Acute angled triangle (f) Obtuse angled triangle

K₃) (a) Right angled triangle (b) Obtuse angled triangle

(c) This type of triangle is not possible because the sum of its angles is not equal to 180° .

$$[i.e. 60^\circ + 60^\circ + 55^\circ = 175^\circ]$$

(d) Equilateral triangle (e) Isosceles triangle

(f) Scalene triangle

9) (a) $\angle P = 60^\circ, \angle Q = 60^\circ, \angle R = 60^\circ$.

As $\angle P + \angle Q + \angle R = 60^\circ + 60^\circ + 60^\circ$
 $= 180^\circ$

\Rightarrow It can be the measurements of the three angles of a triangle.

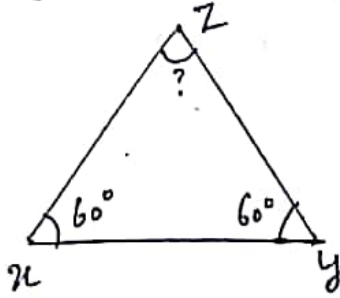
(b) $\angle x = 60^\circ, \angle y = 30^\circ, \angle z = 100^\circ$ (27)

As $60^\circ + 30^\circ + 100^\circ = 190^\circ$

Hence, it cannot be the measurements of the three angles of a triangle.

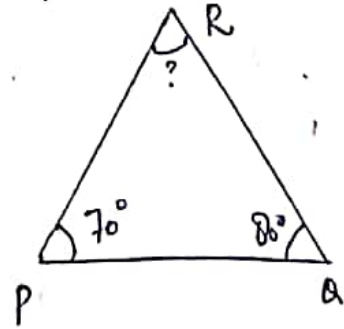
• (c), (d) Do yourself.

S2) (a) $\angle x = 60^\circ, \angle y = 60^\circ$



As, $\angle x + \angle y + \angle z = 180^\circ$
 $\Rightarrow 60^\circ + 60^\circ + \angle z = 180^\circ$
 $120^\circ + \angle z = 180^\circ$
 $\Rightarrow \angle z = 180^\circ - 120^\circ$
 $\Rightarrow \angle z = 60^\circ$

(b) $\angle P = 70^\circ, \angle Q = 80^\circ$

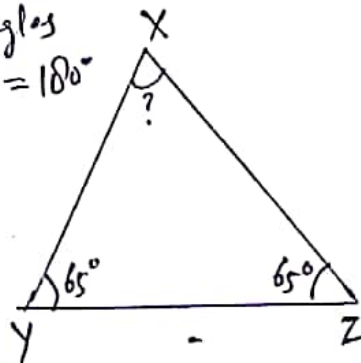


As, $\angle P + \angle Q + \angle R = 180^\circ$
 $\Rightarrow 70^\circ + 80^\circ + \angle R = 180^\circ$
 $\Rightarrow 150^\circ + \angle R = 180^\circ$
 $\Rightarrow \angle R = 180^\circ - 150^\circ$
 $\Rightarrow \angle R = 30^\circ$

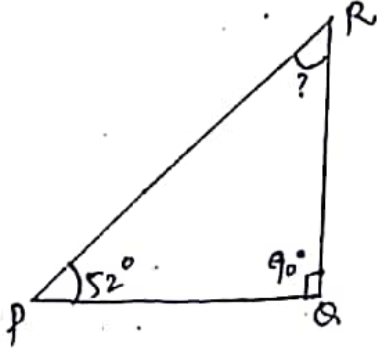
• (c), (d). Do yourself.

S3) As, the sum of all the angles of an isosceles triangle = 180°

$\Rightarrow \angle x + \angle y + \angle z = 180^\circ$
 $\angle x + 65^\circ + 65^\circ = 180^\circ$
 $\angle x + 130^\circ = 180^\circ$
 $\angle x = 180^\circ - 130^\circ$
 $\angle x = 50^\circ$



Q4)

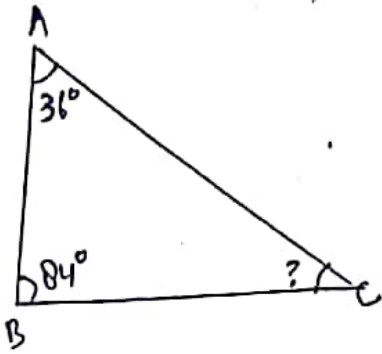


As, $\angle P + \angle Q + \angle R = 180^\circ$
 $\Rightarrow 52^\circ + 90^\circ + \angle R = 180^\circ$
 $142^\circ + \angle R = 180^\circ$
 $\Rightarrow \angle R = 180^\circ - 142^\circ$
 $\angle R = 38^\circ$

20

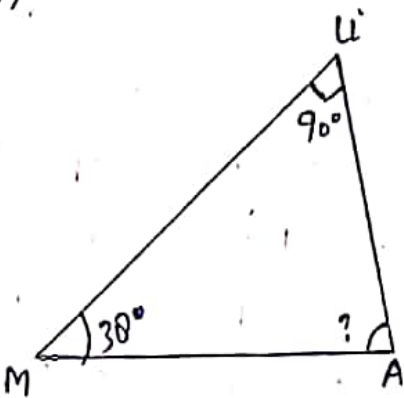
S5)

(a)



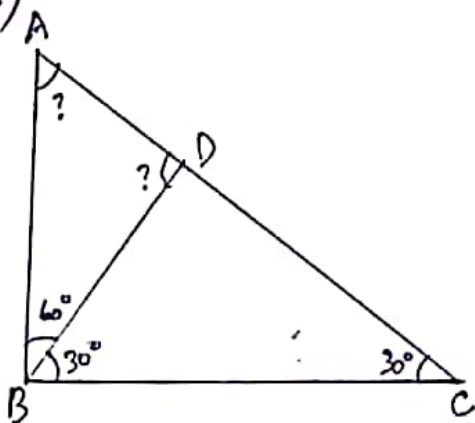
As, $\angle A + \angle B + \angle C = 180^\circ$
 $36^\circ + 84^\circ + \angle C = 180^\circ$
 $120^\circ + \angle C = 180^\circ$
 $\angle C = 180^\circ - 120^\circ$
 $\angle C = 60^\circ$

(b)



As, $\angle M + \angle A + \angle U = 180^\circ$
 $\Rightarrow 38^\circ + \angle A + 90^\circ = 180^\circ$
 $128^\circ + \angle A = 180^\circ$
 $\angle A = 180^\circ - 128^\circ$
 $\angle A = 52^\circ$

S6)



In $\triangle BDC$,
 $\angle DBC + \angle BDC + \angle C = 180^\circ$
 $30^\circ + \angle BDC + 30^\circ = 180^\circ$
 $60^\circ + \angle BDC = 180^\circ$
 $\Rightarrow \angle BDC = 180^\circ - 60^\circ$
 $\Rightarrow \angle BDC = 120^\circ$
 As $\angle ADB + \angle BDC = 180^\circ$
 (Linear Pair)
 $\Rightarrow \angle ADB + 120^\circ = 180^\circ$
 $\angle ADB = 180^\circ - 120^\circ$

$$\angle ADB = 60^\circ$$

Now, in ΔABD

$$\angle A + \angle ABD + \angle ADB = 180^\circ$$

$$\angle A + 60^\circ + 60^\circ = 180^\circ$$

$$\angle A + 120^\circ = 180^\circ$$

$$\Rightarrow \angle A = 180^\circ - 120^\circ$$

$$\Rightarrow \angle A = 60^\circ$$

Definitions:-

Quadrilateral:- A polygon with four sides is a quadrilateral.

Trapezium:- A quadrilateral in which one pair of opposite sides are parallel is known as trapezium.

Parallelogram:- A quadrilateral in which the opposite sides are equal in length and parallel to each other is called a parallelogram.

Rectangle:- A parallelogram with four right angles is called a rectangle.

Rhombus:- A parallelogram with four equal sides is called a rhombus.

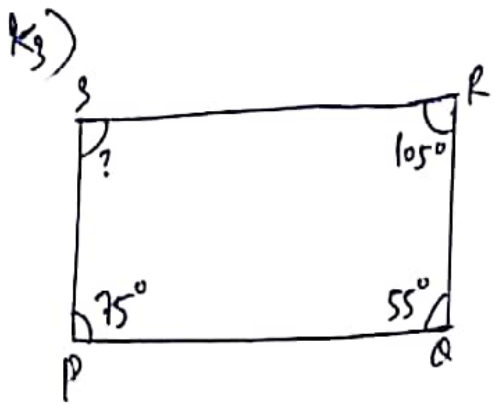
Square:- A rhombus with four right angles is called a square.

• Sum of all the angles of a quadrilateral is 360° .

Exercise:- 5.4

Q1) (a) four (b) four (c) four (d) two (e) opposite
(f) 360° .

Q2) (A) Rectangle (b) Square (c) Parallelogram (d) Rhombus
(e) Trapezium.

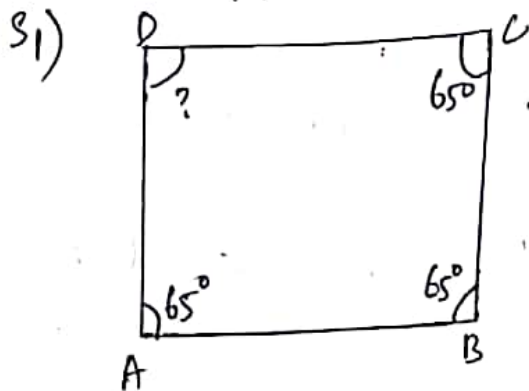


As, $\angle P + \angle Q + \angle R + \angle S = 360^\circ$
 $75^\circ + 55^\circ + 105^\circ + \angle S = 360^\circ$
 $235^\circ + \angle S = 360^\circ$
 $\angle S = 360^\circ - 235^\circ$
 $\angle S = 125^\circ$

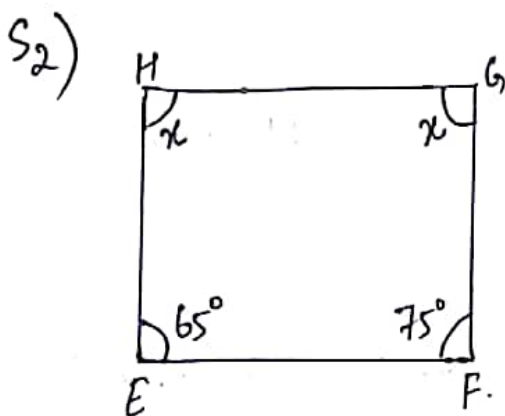
k4) Sum of the opposite angles of a quadrilateral = 180°

\Rightarrow Sum of the other two angles of a quadrilateral = $360^\circ - 180^\circ = 180^\circ$

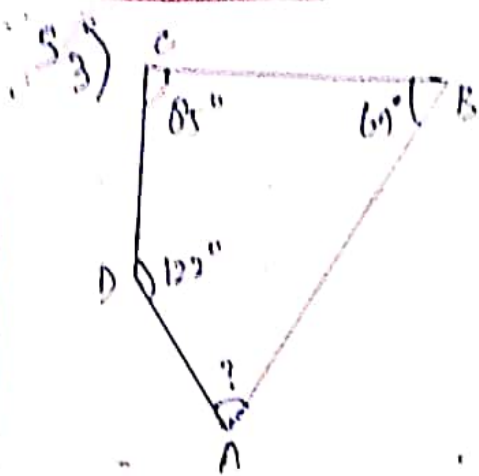
k5) The sum of the angles formed around the point 'O' = 360°



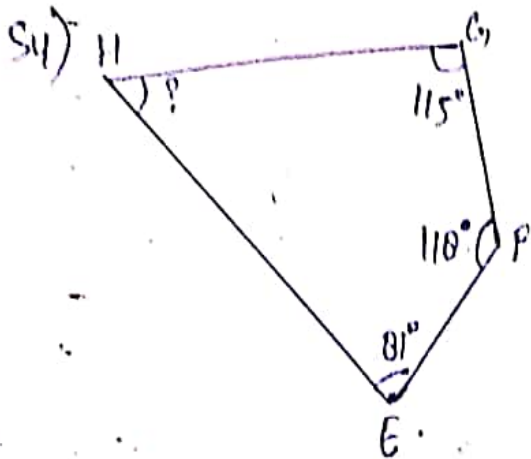
As, $\angle A + \angle B + \angle C + \angle D = 360^\circ$
 $65^\circ + 65^\circ + 65^\circ + \angle D = 360^\circ$
 $195^\circ + \angle D = 360^\circ$
 $\angle D = 360^\circ - 195^\circ$
 $\angle D = 165^\circ$



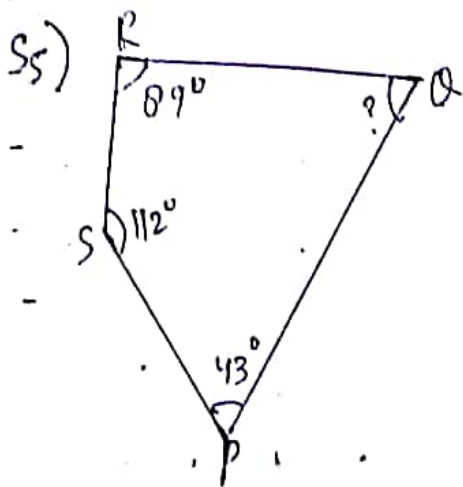
As, $\angle E + \angle F + \angle H + \angle G = 360^\circ$
 $65^\circ + 75^\circ + x + x = 360^\circ$
 $140^\circ + 2x = 360^\circ$
 $2x = 360^\circ - 140^\circ$
 $2x = 220^\circ$
 $\Rightarrow x = \frac{220^\circ}{2}$
 $\Rightarrow x = 110^\circ$
 $\Rightarrow \angle G = \angle H = 110^\circ$



As, $\angle A + \angle B + \angle C + \angle D = 360^\circ$ (31)
 $\angle A + 69^\circ + 85^\circ + 122^\circ = 360^\circ$
 $\angle A + 276^\circ = 360^\circ$
 $\angle A = 360^\circ - 276^\circ$
 $\angle A = 84^\circ$



As, $\angle G + \angle H + \angle I + \angle J = 360^\circ$
 $115^\circ + 118^\circ + 81^\circ + \angle J = 360^\circ$
 $314^\circ + \angle J = 360^\circ$
 $\angle J = 360^\circ - 314^\circ$
 $\angle J = 46^\circ$



As, $\angle P + \angle Q + \angle R + \angle S = 360^\circ$
 $43^\circ + \angle Q + 89^\circ + 112^\circ = 360^\circ$
 $244^\circ + \angle Q = 360^\circ$
 $\angle Q = 360^\circ - 244^\circ$
 $\angle Q = 116^\circ$

Defn: 3D object:

- An object with three dimensions, that is, length, breadth and height is called a three dimensional object or simply a 3D object.
- Some 3D shapes include cube, cuboid, cylinder, cone, sphere, triangular pyramid, square pyramid and prism.

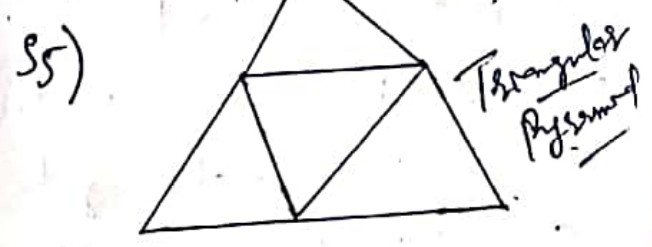
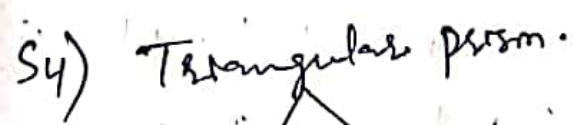
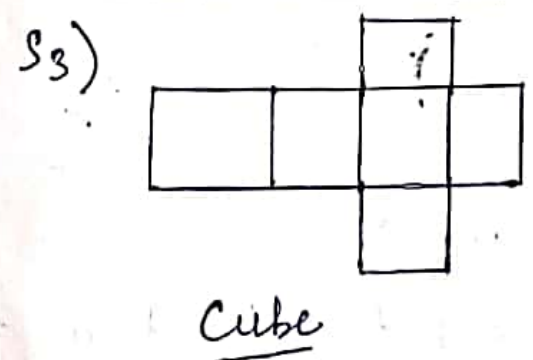
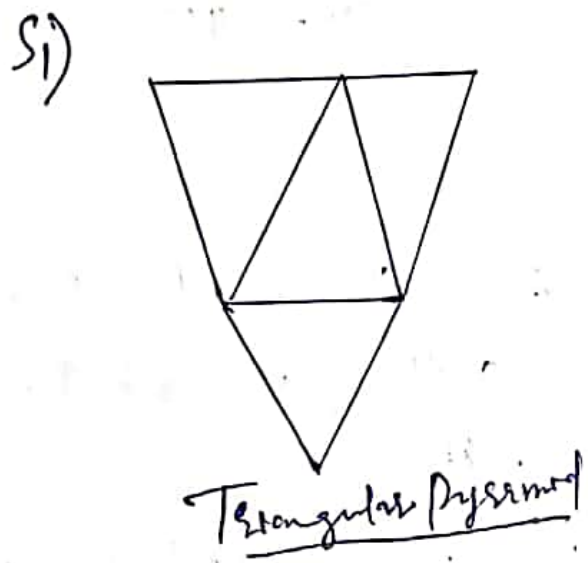
- K1) Dice (cubes) ; Shoe box (cuboid or rectangular prism) ; Ice cream cone (cone) ; Globe (sphere) etc.
- K2) cube ; cuboid ; Triangular prism ; Square pyramid
- K3) Rectangular prism ; pyramid ; cylinder ; cube

K4)

Shape	No. of faces	No. of edges	No. of vertices
Cube	6	12	8
Cuboid	6	12	8
Triangular pyramid	4	6	4
Square pyramid	5	8	5
Triangular prism	5	9	6

K5)

Shape	No. of faces (F)	No. of edges (E)	No. of vertices (V)	F+E-V
Cube	6	12	8	$6+12-8 = 10$
Cuboid	6	12	8	$6+12-8 = 10$
Triangular pyramid	4	6	4	$4+6-4 = 6$
Square pyramid	5	8	5	$5+8-5 = 8$
Triangular prism	5	9	6	$5+9-6 = 8$



S2) Do yourself: