Session: 2024-2025

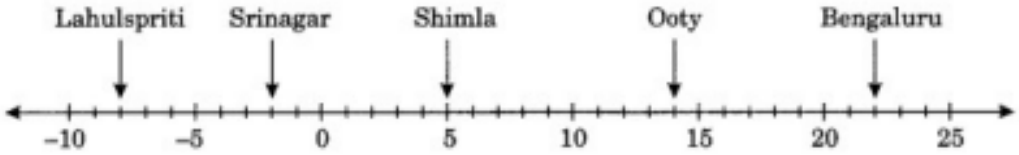
ASSIGNMENT: MATHEMATICS

FORMATIVE ASSESSMENT-I

CLASS: 7TH

INTEGERS EXERCISE 1.1

Q1.Following number line shows the temperature in degree Celsius (°C) at different places on a particular day.



(a) Observe this number line and write the temperature of the places marked on it.
(b) What is the temperature difference between the hottest and the coldest places among the above?
(c) What is the temperature difference between Lahulspriti and Srinagar?
(d) Can we say temperature of Srinagar and Shimla taken together is less than the temperature at Shimla? Is it also less than the temperature at Srinagar?
Solution:

(a) From the given number line, we observe the following temperatures.

Cities	Temperature
Lahulspriti	-8°C
Srinagar	-2°C
Shimla	5°C
Ooty	14°C
Bengaluru	22°C

(b) The temperature of the hottest place = 22°C
The temperature of the coldest place = -8°C
Difference = 22°C – (-8°C)
= 22°C + 8°C = 30°C
(c) Temperature of Lahulspriti = -8°C
Temperature of Srinagar = -2°C
∴ Difference = -2°C – (-8°C)
= -2°C + 8°C = 6°C

(d) Temperature of Srinagar = -2°C
Temperature of Shimla = 5°C
∴ Temperature of the above cities taken together

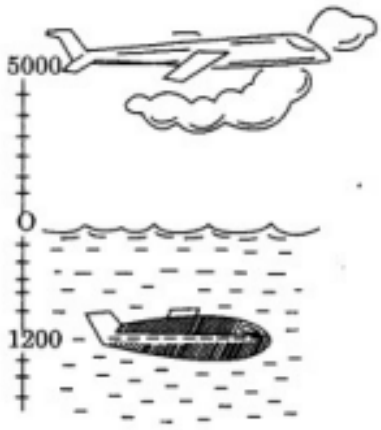
= -2°C + 5°C = 3°C
Temperature of Shimla = 5°C
Hence, the temperature of Srinagar and Shimla taken together is less than that of Shimla by 2°C.
i.e., (5°C – 3°C) = 2°C

No, it is not less than the temperature at Srinagar.

Q2) In a quiz, positive marks are given for correct answers and negative marks are given for incorrect answers. If Arif's scores in five successive rounds were 25, -5, -10, 15 and 10, what was his total at the end?
Solution:
Given scores are 25, -5, -10, 15, 10
Marks given for correct answers
= 25 + 15 + 10 = 50
Marks given for incorrect answers
= (-5) + (-10) = -15
∴ Total marks given at the end
= 50 + (-15) = 50 – 15 = 35

Q3) At Srinagar temperature was -5°C on Monday and then it dropped by 2°C on Tuesday. What was the temperature of Srinagar on Tuesday? On Wednesday, it rose by 4°C. What was the temperature on this day?
Solution:
Initial temperature of Srinagar on Monday = -5°C
Temperature on Tuesday = -5°C – 2°C = -7°C
Temperature was increased by 4°C on Wednesday.
∴ Temperature on Wednesday
= -7°C + 4°C = -3°C
Hence, the required temperature on Tuesday = -7°C
and the temperature on Wednesday = -3°C

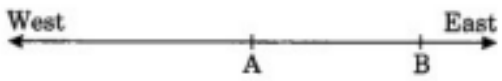
Q4) A plane is flying at the height of 5000 m above the sea level. At a particular point, it is exactly above a submarine flowing 1200 m below the sea level. What is the vertical distance between them?



Solution:
Height of the flying plane = 5000 m
Depth of the submarine = -1200 m
∴ Distance between them
= + 5000 m – (-1200 m)
= 5000 m + 1200 m = 6200 m
Hence, the vertical distance = 6200 m

Q5) Babloo deposits ₹ 2,000 in a bank account and withdraws ₹ 1,642 from it, the next day. If withdrawal of amount from the account is represented by a negative integer, then how will you represent the amount deposited? Find the balance in Babloo's account after the withdrawal.
Solution:
The deposited amount will be represented by a positive integer i.e., ₹ 2000.
Amount withdrawn = ₹ 1,642
∴ Balance in the account
= ₹ 2,000 – ₹ 1,642 = ₹ 358
Hence, the balance in Babloo's account after the withdrawal
= ₹ 358

Q6) Maria goes 20 km towards east from a point A to the point B. From B, she moves 30 km towards west along the same road. If the distance towards east is represented by a positive integer, then how will you represent her final position from A?



Solution:
Distances travelled towards east from point A will be represented by positive integer i.e. +20 km.

Distance travelled towards the west from point B will be represented by negative integer, i.e., —30 km.
Final position of Maria from A
= 20 km – 30 km = – 10 km
Hence, the required position of Maria will be presented by a negative number, i.e., -10.

Q7) In a magic square each row, column and the diagonal have the same sum. Check which of the following is a magic square?

5	–1	–4
–5	–2	7
0	3	–3

(*i*)

1	–10	0
–4	–3	–2
–6	4	–7

(*ii*)

Solution:
(i) Row one $R_1 = 5 + (-1) + (—4)$
$=5 – 1 – 4 = 5 – 5 = 0$
Row two $R_2 = (-5) + (-2) + 7$
$= -5 – 2 + 7 = -7 + 7 = 0$
Row three $R_3 = 0 + 3 + (-3)$
$= 0 + 3 - 3 = 0$
Column one $C_1 = 5 + (-5) + 0$
$= 5 – 5 + 0 = 0$
Column two $C_2 = (-1) + (-2) + (3)$
$=-1 – 2 + 3 = -3 + 3 = 0$
Column three $C_3 = (-4) + 7 + (-3)$
$= -4 + 7 – 3 = 7 – 7 = 0$
Diagonal $d_1 = 5 + (-2) + (-3)$
$= 5 – 2 - 3 = 5 – 5 = 0$
Diagonal $d_2 = (-4) + (-2) + 0$
$= -4 – 2 + 0 = -6 + 0 = -6$
Here, the sum of the integers of diagonal d2 is different from the others.
Hence, it is not a magic square.

(ii) Row one $R_1 = 1 + (-10) + 0$
$= 1 – 10 + 0 = -9$
Row two $R_2 = (-4) + (-3) + (-2)$
$= -4 – 3 – 2 = -9$
Row three $R_3 = (-6) + (4) + (-7)$

$= -6 + 4 - 7 = -9$

Column one $C_1 = 1 + (-4) + (-6)$

$= 1 - 4 - 6 = -9$

Column two $C_2 = (-10) + (-3) + 4$

$= -10 - 3 + 4 = -9$

Column three $C_3 = 0 + (-2) + (-7)$

$= 0 - 2 - 7 = -9$

Diagonal $d_1 = 1 + (-3) + (-7)$

$= 1 - 3 - 7 = 1 - 10 = -9$

Diagonal $d_2 = 0 + (-3) + (-6)$

$= 0 - 3 - 6 = -9$

Here, sum of the integers column wise, row wise and diagonally is same i.e. -9.

Hence, (ii) is a magic square.

Q8) Verify $a - (-b) = a + b$ for the following values of a and b.

(i) $a = 21, b = 18$

(ii) $a = 118, b = 125$

(iii) $a = 75, b = 84$

(iv) $a = 28, 6 = 11$

Solution:

(i) $a - (-b) = a + b$

LHS $= 21 - (-18) = 21 + 18 = 39$

RHS $= 21 + 18 = 39$

LHS = RHS Hence, verified.

(ii) $a - (-b) = a + b$

LHS $= 118 - (-125) = 118 + 125 = 243$

RHS $= 118 + 125 = 243$

LHS = RHS Hence, verified.

(iii) $a - (-b) = a + b$

LHS $= 75 - (-84) = 75 + 84 = 159$

RHS $= 75 + 84 = 159$

LHS = RHS Hence, verified.

(iv) $a - (-b) = a + b$

LHS $= 28 - (-11) = 28 + 11 = 39$

RHS $= 28 + 11 = 28 + 11 = 39$

LHS = RHS Hence, verified.

EXERCISE 1.2

Q1) Write down a pair of integers whose:
(a) sum is -7
(b) difference is -10
(c) sum is 0.
Solution:
(a) Let us take a pair of integers -3 and -4.
∴ (-3) + (-4) = -3 – 4 = -7
(b) Let us take a pair of integers -12 and -2
∴ (-12) – (-2) = -12 + 2 = -10
(c) Let us take a pair of integers -3 and 3
∴ (-3) + (3) = -3 + 3 = 0

Q2) (a) Write a pair of negative integers whose difference gives 8.
(b) Write a negative integer and positive integer whose sum is -5.
(c) Write a negative integer and a positive integer whose difference is -3.
Solution:
(a) Let us have -2 and -10
∴ Difference = (-2) – (-10) = -2 + 10 = 8
(b) Let us have -7 and 2
∴ (-7) + (2) = -7 + 2 = -5
(c) Let us have -2 and 1
∴ (-2) – (1) = – 2 – 1 = -3

Q3) In a mathematics quiz programme, team A scored -40, 10, 0 and team B scored 10, 0, -40 in three successive rounds. Which team scored more? Can you say that we can add integers in any order?
Solution:
Total score of team A = (-40) + (10) + (0) – -40 + 10 + 0 = -30
Total score of team B = 10 + 0 + (-40) = 10 + 0 – 40 = -30
∴ The scores of both the teams are same i.e. -30.
Yes, we can add the integers in any order.

Q4) Fill in the blanks to make the following statements true:
(i) (-5) + (-8) = (-8) + (…)
(ii) -58 + … = -58
(iii) -19 + … = 0
(iv) [10 + (-13)] + (…) = 10 + [(-13) + (-7)]
(v) (-2) + [14 + (-5)] = [-2 + 14] + …

Solution:

(i) -5 + (-8) – (-8) + (-5) [Commutative law of additions]

(ii) -58 + 0 = -58 [Additive Identity]

[Adding 0 to any integer, it gives the same value]

(iii) -19 + (19) = 0 [Additive inverse]

(iv) [10 + (-13)] + (-7) = 10 + [(-13) + (-7)] [Associative law of addition]

(v) (-2) + [14 + (-5)] = [-2 + 14] +(-5) [Associative law of addition]

EXERCISE 1.3

Q1) Find each of the following products:

(a) 3 × (-1)

(b) (-1) × 225

(c) (-21) × (-30)

(d) (-316) × (-1)

(e) (-15) × 0 × (-18)

(f) (-12) × (-11) × (10)

(g) 9 × (-3) × (-6)

(h) (-18) × (-5) × (-4)

(i) (-1) ×(-2) × (-3) × 4

(j) (-3) × (-6) × (-2) × (-1)

Solution:

(a) 3 × (-1) = -3 × 1 = -3

(b) (-1) × 225 = -1 × 225 = -225

(c) (-21) × (-30) = -21 × -30 = 630

(d) (-316) × (-1) = - 316 × -1 = 316

(e) (-15) × 0 × (-18) = 0 [∵ a × 0 = a]

(f) (-12) × (-11) × (10)

= -12 × -11 × 10 = 1320

(g) 9 × (-3) × (-6) = (-3) × (-6) × 9

= - 3 × -6 × 9 = 162

(h) (-18) × (-5) × (-4)

= -18 × -5 × -4 = -360

(i) (-1) × (-2) × (-3) × 4

= - 1 × -2 × -3 × 4 = -24

(j) (-3) × (-6) × (-2) × (-1)

= - 3 ×- 6 × -2 × -1 = 36

Q2) Verify the following:

(a) 18 × [7 + (-3)] = [18 × 7] + [18 × (-3)]

(b) $5 \times [7 + (-6)] = 5\times 7 + 5 \times (-6)]$

Solution:

(a) $18 \times [7 + (-3)] = [18 \times 7] + [18 \times (-3)]$

LHS $= 18 \times [7 + (-3)] = 18 \times 4 = 72$

RHS $= [18 \times 7] + [18 \times (-3)] = 126 + (-54)$

$= 126 - 54 = 72$

LHS = RHS

Hence, verified.

(b) $5 \times [7 + (-6)] = 5\times 7 + 5 \times (-6)]$

LHS $= 5 \times [7 + (-6)] = 5 \times 1 = 5$

RHS $= 5\times 7 + 5 \times (-6)]$

$= (35) + (-30) = 5$

LHS = RHS

Hence, verified.

Q3) (i) For any integer a, what is $(-1) \times a$ equal to? (ii)For any integer m, what is $(-1) \times m$ equal to?

Solution:

(i) $(-1) \times a = -a$

ii) $(-1) \times m = -m$

Q4) Find the integer whose product with (-1) is .

(a) -12 (b) 0 (c)131

Sol.

(a) $(-1) \times \underline{12} = -12$.

b) $(-1) \times \underline{0} = 0$.

c) $(-1) \times \underline{-131} = 131$.

Q5) Find the product, using suitable properties:

(a) $14 \times (-5) + 14 \times 7$

(b) $8 \times 53 \times (-121)$

(c) $15 \times (-25) \times (-10) \times (-5)$

(d) $7 \times (50 - 3)$

(e)$625 \times (-35) + (-625) \times 65$

(f) $(-17) \times (-28)$

(g) $(-57) \times (-19) + 57$

Solution:

(a) $14 \times (-5) + 14 \times 7$

$= 14 \times [(-5) + 7] = 14 \times [2] = 28$[Distributive property of multiplication over addition]

(b) $8 \times 53 \times (-121) = 53 \times [8 \times (-121)]$

[Associative property of multiplication] $= 53 \times (-968) = -51304$

(c) $15 \times (-25) \times (-10) \times (-5)$

$= [(-25) \times (-5)] \times [15 \times (-10)]$

[Regrouping the terms] $= 125 \times (-150) = -18750$

(d) $7 \times (50 - 3)$

$= 7 \times (50 - 3) = 7 \times 47 = 329$ or

$7 \times (50 - 3) = 7 \times 50 - 7 \times 3 = 350 - 21 = 329$ [Distributive property of multiplication over addition]

(e) $625 \times (-35) + (-625) \times 65$

$= 625 \times [(-35) + (-65)]$

[Distributive property of multiplication over addition]

$= 625 \times (-100) = -62500$

(f) $(-17) \times (-28) = (-17) \times [-30 + 2]$

$= (-17) \times (-30) + (-17) \times (2)$

$= 510 - 34 = 476$

[Distributive property of multiplication over addition]

(g) $(-57) \times (-19) + 57 = 57 \times 19 + 57$

$= 57 \times 19 + 57 \times 1$ [$\because (-) \times (-) = (+)$]

[Distributive property of multiplication over addition]

$= 57 \times (19 + 1) = 57 \times 20 = 1140$

Q6) A certain freezing process requires that room temperature be lowered from 40°C at the rate of 5°C every hour. What will be the room temperature 10 hours after the process begins?

Solution:Temperature of the room in the beginning = 40°C

Temperature after 1 hour

$= 40°C - 1(hr) \times 5°C = 40°C - 5°C = 35°C$

Similarly, temperature of the room after 10 hours

$= 40°C - 10\ (hr) \times 5°C = 40°C - 50°C = -10°C$

Q7) In a class test containing 10 questions, 5 marks are awarded for every correct answer and (-2) marks are awarded for every incorrect answer and 0 for questions not attempted.
(i) Arif gets four correct and six incorrect answers. What is his score?
(ii) Maria gets five correct answers and five incorrect answers, what is her score?
(iii) Sabiya gets two correct and five incorrect answers out of seven questions she attempts. What is her score?
Solution:
(i) Marks awarded to Arif for correct answers= $4 \times 5=20$

Marks awarded to Arif for incorrect answers= $6 \times (-2) = -12$.
∴ Total marks obtained by Arif
$= 20 + (-12) = 20 - 12 = 8$

(ii) Marks awarded to Maria for correct answers
$= 5 \times 5 = 25$
Marks awarded to Maria for incorrect answers
$= 5 \times (-2) = -10$
∴ Total marks obtained by Maria
$= 25 + (-10) = 25 - 10 = 15$

(iii) Marks awarded to Sabiya for correct answers
$= 2 \times 5 = 10$
Marks awarded to Sabiya for incorrect answers
$= 5 \times (-2) = -10$
Number of question not attempted by Sabiya
$= 10 - (2 + 5) = 10 - 7 = 3$
Marks awarded to Sabiya for non-attempted questions
$=3 \times 0=0$
∴ Total marks obtained by Sabiya
$= 10 + (-10) + 0 = 10-10+ 0 = 0$

Q8) A cement company earns a profit of ₹ 8 per bag of white cement sold and a loss of ₹ 5 per bag of grey cement sold.
(a) The company sells 3,000 bags of white cement and sold 5,000 bags of grey cement in a month. What is its profit or loss?
(b) What is the number of white cement bags it must sell to have neither profit nor loss, if the number of grey bags sold is 6,400 bags.
Solution:
(a) Profit on one white cement bag = ₹ 8

loss on one grey cement bag = ₹ – 5
Profit on 3,000 bags of white cement
= ₹ (8 × 3,000) = ₹ 24,000
Loss on 5,000 bags of grey cement
= ₹ (-5 × 5000) = – ₹ 25,000
Total loss = – ₹ 25,000 + ₹ 24,000
= – ₹ 1000 i.e. ₹ 1000

(b) Selling price of grey bags at a loss of ₹ 5
= ₹ (5 × 6,400) = ₹ 32,000
For no profit and no loss, the selling price of white bags = ₹ 32,000
Rate of selling price of white bags at a profit of ₹ 8 per bag.
∴ Number of white cement bags sold
=32000÷8=4000
Hence, the required number of bags = 4,000

Q9) Replace the blank with an integer to make it a true statement.
(a) (-3) × __ = 27
(b) 5 × __ = -35
(c) __ × (-8) = -56
(d) __ × (-12) = 132
Solution:
(a) (-3) × __ = 27 = (-3) × (-9) = 27 [∵ (-) × (-) = (+)]
(b) 5 × __ = -35 = 5 × (-7) = -35 [∵ (+) × (-) = (-)]
(c) __ × (-8) = -56 = 7 × (-8) = -56 [∵ (+) × (-) = (-)]
(d) __ × (-12) = 132 = (-11) × (-12) = 132 [∵ (-) × (-) = (+)]

Q10 Fill in the blanks.

(a) -4 ×(-9)= 36 (b) 5 × (-9) = -45 (c) (-3) × (11) = -33

EXERCISE 1.4

Q1) Evaluate each of the following:
(a) (-24) ÷ 5
(b) 25 ÷ (-5)
(c) (-36) ÷ (-9)
(d) (-49) ÷ (49)
(e) 13 ÷ [(-2) +(-11)]

(f) $0 \div (-13)$
(g) $(-32) \div [(-15) + 13]$
Solution:
(a) $(-24) \div 5 = -4.8$
(b) $25 \div (-5) = -(25) \div 5 = -5$ because : $a \div (-b) = (-a) \div b$
(c) $(-36) \div (-9) = 36 \div 9 = 4$ because : $(-a) \div (-b) = a \div b$
(d) $(-49) \div (49) = -49 \div 49 = -1$
(e) $13 \div [(-2) + (-11)] = 13 \div (-13) = -(13) \div 13 = -1$
(f) $0 \div (-13) = 0$
(g) $(-32) \div [(-15) + (13)] = (-32) \div (-2) = 16$
Q2) Verify that: $a \div (b + c) \neq (a \div b) + (a \div c)$ for each of the following values of a, b and c.
(a) $a = 12, b = -6, c = 4$
(b) $a = (-10), b = 1, c = 1$
Solution:
(a) $a = 12, b = -6, c = 4$
$a \div (b + c) = 12 \div [(-6) + 4]$
$= 12 \div (-2) = -6$
$(a \div b) + (a \div c) = [12 \div (-6)] + [12 \div 4]$
$= -2 + 3 = 1$
Since, $(-6) \neq 1$
Hence, $a \div (b + c) \neq (a \div b) + (a \div c)$

(b) $a = (-10), b = 1, c = 1$
$a \div (b + c) = (-10) \div (1 + 1)$
$= (-10) \div 2 = -10 \div 2 = -5$
$(a \div b) + (a \div c)$
$= [(-10) \div 1] + [(-10) \div 1]$
$= (-10) + (-10) = -20$
Since $(-5) \neq (-20)$
Hence, $a \div (b + c) \neq (a \div b) + (a \div c)$

Q3) Fill in the blanks:
(a) $369 \div \_\_\_ = 369$
(b) $(-65) \div (\ ) = 13$
(c) $(-91) \div (\ ) = -7$
(d) $-84 \div (\ ) = 1$
(e) $64 \div (\ ) = 16$
Solution:

(a) 369 ÷ ___ = 369 = 369 ÷ 1 = 369
(b) (-65) ÷ ___ = 13 = (-65) ÷ -5 = 13
(c) (-91) ÷ ___ = 7 = (-91) ÷ (-13) = 7
(d) -84 ÷ ___ = 1 = -84 ÷ (-84) = 1
(e) 64÷___=-16= 64÷(-4)

Q4) Write five pairs of integers (a, b) such that a ÷ b = -3. One such pair is (6, -2) because 6 ÷ (-2) = -3.
Solution:
(a) (24, -8) because 24 ÷ (-8) = -3
(b) (-12, 4) because (-12) ÷ 4 = -3
(c) (15, -5) because 15 ÷ (-5) = -3
(d) (18, -6) because 18 ÷ (-6) = -3
(e) (60, -20) because 60 ÷ (-20) = -3

Q5) The temperature at 12 noon was 10°C above zero. If it decreases at the rate of 2°C per hour until midnight, at what time would the temperature be 8°C below zero? What would be the temperature at midnight? (Error in question : It is 2°C not 20°C)
Solution:
Temperature at 12 noon was 10°C above zero i.e. +10°C
Rate of decrease in temperature per hour = 2°C
Number of hours from 12 noon to midnight = 12
∴ Change in temperature in 12 hours
= 12 × (-2°C) = -24°C
∴ Temperature at midnight
= +10°C + (-24°C) = -14°C
Hence, the required temperature at midnight =-14°C
Difference in temperature between + 10°C and -8°C
= +10°C – (-8°C) = +10°C + 8°C = 18°C
Number of hours required = 18∘C2∘C= 9 hours
∴ Time after 9 hours from 12 noon = 9 pm.

Q6) In a class test (+3) marks are given for every correct answer and (-2) marks are given for every incorrect answer and no marks for not attempting any question:
(i) Suraiya scored 20 marks. If she has got 12 correct answers, how many questions has she attempted incorrectly?

(ii) Raziya scores -5 marks in this test, though she has got 7 correct answers. How many questions has she attempted incorrectly?
Solution:
Given that:
+3 marks are given for each correct answer. (-2) marks are given for each incorrect answer. Zero marks for not attempted questions.
(i) Marks obtained by Suriya for 12 correct answers = (+3) × 12 = 36
Total marks obtained by Suriya = 20
∴ Marks obtained by Suriya for incorrect answers = 20 – 36 = -16
Number of incorrect answers
$=(-16)\div(-2)=8$
Hence, the required number of incorrect answers = 8

(ii) Marks scored by Raziya = -5
Number of correct answers = 7
∴ Marks obtained by Raziya for 7 correct answers = 7 × (+3) = 21
Marks obtained for incorrect answers
= -5 – 21 = (-26)
∴ Number of incorrect answers
= (-26) ÷ (-2) = 13
Hence, the required number of incorrect answers – 13.

Q7) An elevator descends into a nine shaft at the rate of 6 m/min. If the descent starts from 10 m above the ground level, how long will it take to reach -350 m.
Solution:
The present position of the elevator is at 10 m above the ground level.
Distance moved by the elevator below the ground level = 350 m

∴ Total distance moved by the elevator = 350 m + 10 m = 360 m
Rate of descent = 6 m/min.
Total time taken by the elevator
$=360\div6\text{m/min}$
= 60 minutes = 1 hour
Hence, the required time = 1 hour.

Fractions and Decimals

EXERCISE 2.1

Q1) Solve:

(*i*) $2-\frac{3}{5}$ (*ii*) $4+\frac{7}{8}$

(*iii*) $\frac{3}{5}+\frac{2}{7}$ (*iv*) $\frac{9}{11}-\frac{4}{15}$

(*v*) $\frac{7}{10}+\frac{2}{5}+\frac{3}{2}$ (*vi*) $2\frac{2}{3}+3\frac{1}{2}$

(*vii*) $8\frac{1}{2}-3\frac{5}{8}$

Solution:

(*i*) $2-\frac{3}{5}=\frac{2}{1}-\frac{3}{5}=\frac{2\times5-3\times1}{1\times5}$

$=\frac{10-3}{5}=\frac{7}{5}=1\frac{2}{5}$

Hence, $2-\frac{3}{5}=1\frac{2}{5}$

$5\overline{)\,7\,(1}$
$\underline{-5}$
2

(*ii*) $4+\frac{7}{8}=\frac{4}{1}+\frac{7}{8}=\frac{4\times8+1\times7}{1\times8}$

$=\frac{32+7}{8}=\frac{39}{8}=4\frac{7}{8}$

$8\overline{)\,39\,(4}$
$\underline{-32}$
7

Hence, $4+\frac{7}{8}=4\frac{7}{8}$

(*iii*) $\frac{3}{5}+\frac{2}{7}=\frac{3\times7+2\times5}{5\times7}=\frac{21+10}{35}=\frac{31}{35}$

Hence, $\frac{3}{5}+\frac{2}{7}=\frac{31}{35}$

(*iv*) $\frac{9}{11}-\frac{4}{15}=\frac{9\times15-4\times11}{11\times15}=\frac{135-44}{165}=\frac{91}{165}$

Hence, $\frac{9}{11}-\frac{4}{15}=\frac{91}{165}$

(v) $\frac{7}{10}+\frac{2}{5}+\frac{3}{2}=\frac{7+4+15}{10}$

[LCM of 10, 5 and 2 = 10]

$=\frac{26}{10}=\frac{26\div 2}{10\div 2}=\frac{13}{5}=2\frac{3}{5}$

Hence, $\frac{7}{10}+\frac{2}{5}+\frac{3}{2}=2\frac{3}{5}$

$5\overline{)13}\,(2$
-10
3

(vi) $2\frac{2}{3}+3\frac{1}{2}=\frac{8}{3}+\frac{7}{2}=\frac{8\times 2+3\times 7}{3\times 2}$

$=\frac{16+21}{6}=\frac{37}{6}=6\frac{1}{6}$

Hence, $2\frac{2}{3}+3\frac{1}{2}=6\frac{1}{6}$

$6\overline{)37}\,(6$
-36
1

(vii) $8\frac{1}{2}-3\frac{5}{8}=\frac{17}{2}-\frac{29}{8}$ [LCM of 2 and 8 = 8]

$=\frac{17\times 4-29\times 1}{8}$

$=\frac{68-29}{8}=\frac{39}{8}=4\frac{7}{8}$

Hence, $8\frac{1}{2}-3\frac{5}{8}=4\frac{7}{8}$

$8\overline{)39}\,(4$
-32
7

Q2) **2. Arrange the following in ascending order:**

(i)4/7 ,2/5 ,4/35, 8/7

Solution:-

LCM of 7,5,35,7 = 35

Now, let us change each of the given fractions into an equivalent fraction having 35 as the denominator.

[(4/7) × (5/5)] = (20/35)

[(2/5) × (7/7)] = (14/35)

[(4/35) × (1/1)] = (4/35)

[(8/7) × (5/5)] = (40/35)

Clearly,

$(4/35) < (14/35) < (20/35) < (40/35)$

Hence, the given fractions in ascending order are

$(4/35) < (2/5) < (4/7) < (8/7)$

Q3) In a "magic square" the sum of number in each row, in each column and along the diagonals is the same. Is this a magic square?

$\frac{2}{13}$	$\frac{9}{13}$	$\frac{4}{13}$
$\frac{7}{13}$	$\frac{5}{13}$	$\frac{3}{13}$
$\frac{6}{13}$	$\frac{1}{13}$	$\frac{8}{13}$

Solution:

Along the First row = 2/13 + 9/13 +4/13 =15/13

Along this second row= 7/13 + 5/13 +3/13 =15/13

Along the third row =6/13 + 1/13 +8/13 =15/13

Along the first column =2/13 + 7/13 +6/13 =15/13

Along the second column=9/13 + 5/13 +1/13 =15/13

Along the third column= 4/13 + 3/13 +8/13 =15/13

Along the first diagonal=2/13 + 5/13 +8/13 =15/13

Along the second diagonal=4/13 + 5/13 +6/13 =15/13

Since, the sum of all the fraction row wise, column wise and the diagonal wise is same i.e. 15/13
Hence, it is a magic square.

Q4) A rectangular sheet of paper is 12 1/2 cm long and 10 2/3 cm wide. Find its perimeter.

Solution:

Length of sheet = $12\frac{1}{2}$ cm = $\frac{25}{2}$ cm

Breadth of the sheet = $10\frac{2}{3} = \frac{32}{3}$ cm

Perimeter = 2 × [length + breadth]

$= 2 \times \left[\frac{25}{2} + \frac{32}{3}\right]$ cm

$= 2 \times \left[\frac{25 \times 3 + 32 \times 2}{2 \times 3}\right]$ cm

$= 2 \times \left[\frac{75 + 64}{6}\right]$ cm

[LCM of 2 and 3 = 6]

$= {}^{1}\cancel{2} \times \frac{139}{\cancel{6}_{3}} = \frac{139}{3}$

$= 46\frac{1}{3}$ cm

```
3) 139 (46
   12
   --
   19
   18
   --
    1
```

Hence, the required perimeter = $46\frac{1}{3}$ cm.

Q5) find the perimeter of i) ΔABC ii) the square BCEF in the figure **(refer book).** Whose parameter is greater ?

Ans Perimeter of ΔABC = sum of its three sides

$= AB+BC+CA$

$= 3\frac{2}{8} + 2\frac{1}{4} + 2\frac{3}{2}$

$= \frac{26}{8} + \frac{9}{4} + \frac{7}{2}$

$= \frac{26+(9x2)+(7x4)}{8}$ (LCM of 8,4 , 2 is 8)

$= \frac{26\ \ (18)+(28)}{8}$

$= \frac{72}{8}$

$= 9$

Perimeter of BCEF = 4 X Side of square

$$= 4 \times BC$$

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

$$= 4 \times \frac{7}{2} = \frac{28}{2} = 14$$

Thus perimeter of Square BCEF is greater than the perimeter of the ΔABC

Q6) Salim wants to put a picture in a frame. The picture is $7\frac{3}{5}$ cm wide. To fit in the frame, the picture cannot be more than $7\frac{3}{10}$ cm wide. How much should the picture be trimmed?

Solution:

The width of the picture

$$= 7\frac{3}{5} \text{ cm} = \frac{38}{5} \text{ cm}$$

The required width of the frame

$$= 7\frac{3}{10} \text{ cm} = \frac{73}{10} \text{ cm}$$

∴ The width of the picture to be trimmed of

$$= \frac{38}{5} \text{ cm} - \frac{73}{10} \text{ cm} = \left(\frac{38}{5} - \frac{73}{10}\right) \text{cm}$$

$$= \left(\frac{2 \times 38 - 73 \times 1}{10}\right) \text{ cm}$$

[LCM of 5 and 10 = 10]

$$= \left(\frac{76 - 73}{10}\right) \text{ cm} = \frac{3}{10} \text{ cm}$$

Hence, the required width to be trimmed $= \frac{3}{10}$ cm.

Q7) Sameena ate $\frac{1}{3}$ part of chocolate which her mother gave. Her sister Rukhsana ate the remaining chocolate. How much part of the chocolate did Rukhsana eat? Who had the larger share? By how much?

Solution:

Let the whole part of the chocolate be 1.

Sameena share $= \frac{1}{3}$

Rukhsana share = Total – Sameena share

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

$$= \frac{1x3-1}{3}$$

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

Thus Rukhsana had the larger share as $\frac{2}{3} > \frac{1}{3}$

Rukhsana share is larger by $= \frac{2}{3} - \frac{1}{3} = \frac{2-1}{3} = \frac{1}{3}$

Q8) Akram finished colouring a picture in 7/12 hour. Ashiq finished colouring the same picture in 3/4 hour. Who worked longer? By what fraction was it longer?

Solution : Try yourself

EXERCISE 2.2

Q3) Multiply and reduce to lowest form and convert into a mixed fraction:

(*i*) $7 \times \frac{3}{5}$ (*ii*) $4 \times \frac{1}{3}$ (*iii*) $2 \times \frac{6}{7}$

(*iv*) $5 \times \frac{2}{9}$ (*v*) $\frac{2}{3} \times 4$ (*vi*) $\frac{5}{2} \times 6$

(*vii*) $11 \times \frac{4}{7}$ (*viii*) $20 \times \frac{4}{5}$ (*ix*) $13 \times \frac{1}{3}$

(*x*) $15 \times \frac{3}{5}$

xi) $16 \text{ x } \frac{3}{8}$ xii) $6 \text{ x } \frac{3}{7}$

Solution:

(*i*) $7 \times \frac{3}{5} = \frac{21}{5} = 4\frac{1}{5}$

$$\begin{array}{r|l} 5 & 21 \\ -20 & 4 \\ \hline 1 & \end{array}$$

(*ii*) $4 \times \frac{1}{3} = \frac{4}{3} = 1\frac{1}{3}$

$$\begin{array}{r|l} 3 & 4 \\ -3 & 1 \\ \hline 1 & \end{array}$$

(*iii*) $2 \times \frac{6}{7} = \frac{12}{7} = 1\frac{5}{7}$

$$\begin{array}{r|l} 7 & 12 \\ -7 & 1 \\ \hline 5 & \end{array}$$

(*iv*) $5 \times \frac{2}{9} = \frac{10}{9} = 1\frac{1}{9}$

$$\begin{array}{r|l} 9 & 10 \\ -9 & 1 \\ \hline 1 & \end{array}$$

(*v*) $\frac{2}{3} \times 4 = \frac{8}{3} = 2\frac{2}{3}$

$$\begin{array}{r|l} 3 & 8 \\ -6 & 2 \\ \hline 2 & \end{array}$$

(*vi*) $\frac{5}{2} \times 6 = \frac{\cancel{30}^{15}}{\cancel{2}} = 15$

(*vii*) $11 \times \frac{4}{7} = \frac{44}{7} = 6\frac{2}{7}$

$$\begin{array}{r|l} 7 & 44 \\ -42 & 6 \\ \hline 2 & \end{array}$$

(*viii*) $20 \times \frac{4}{5} = \frac{\cancel{80}^{16}}{\cancel{5}} = 16$

(*ix*) $13 \times \frac{1}{3} = \frac{13}{3} = 4\frac{1}{3}$

$$\begin{array}{r|l} 3 & 13 \\ -12 & 4 \\ \hline 1 & \end{array}$$

(*x*) $15 \times \frac{3}{5} = \frac{\cancel{45}^{9}}{\cancel{5}} = 9$

For (xi) and (xii) Try it yourself

Q5) Find:

(*a*) $\frac{1}{2}$ of (*i*) 24 (*ii*) 46 (*b*) $\frac{2}{3}$ of (*i*) 18 (*ii*) 27

(*c*) $\frac{3}{4}$ of (*i*) 16 (*ii*) 36 (*d*) $\frac{4}{5}$ of (*i*) 20 (*ii*) 35

Solution:

(a) (i) $\frac{1}{2}$ of $24 = \frac{1}{\cancel{2}} \times \cancel{24}^{12} = 12$

(ii) $\frac{1}{2}$ of $46 = \frac{1}{\cancel{2}} \times \cancel{46}^{23} = 23$

(b) (i) $\frac{2}{3}$ of $18 = \frac{2}{\cancel{3}} \times \cancel{18}^{6} = 12$

(ii) $\frac{2}{3}$ of $27 = \frac{2}{\cancel{3}} \times \cancel{27}^{9} = 18$

(c) (i) $\frac{3}{4}$ of $16 = \frac{3}{\cancel{4}} \times \cancel{16}^{4} = 12$

(ii) $\frac{3}{4}$ of $36 = \frac{3}{\cancel{4}} \times \cancel{36}^{9} = 27$

(d) Try it yourself

Q6) Multiply and express as a mixed fraction.

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

(d) $4 \times 6\frac{1}{3}$ (e) $3\frac{1}{4} \times 6$ (f) $3\frac{2}{5} \times 8$

Solution

(a) $3 \times 5\frac{1}{5} = 3 \times \frac{26}{5}$

$= \frac{78}{5}$

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

$5\overline{)\,78\,(15}$
-5
28
-25
3

(b) $5 \times 6\frac{3}{4} = 5 \times \frac{27}{4}$

$= \frac{135}{4}$

$= 33\frac{3}{4}$

$4\overline{)\,135\,(33}$
-12
15
-12
3

(c) $7 \times 2\frac{1}{4} = 7 \times \frac{9}{4}$

$= \frac{63}{4} = 15\frac{3}{4}$

$4\overline{)\,63\,(15}$
-4
23
-20
3

(d) $4 \times 6\frac{1}{3} = 4 \times \frac{19}{3}$

$= \frac{76}{3}$

$= 25\frac{1}{3}$

$3\overline{)\,76\,(25}$
-6
16
-15
1

(e) $3\frac{1}{4} \times 6 = \frac{13}{\cancel{4}_{2}} \times \cancel{6}^{3}$

$= \frac{13 \times 3}{2}$

$= \frac{39}{2} = 19\frac{1}{2}$

$2\overline{)\,39\,(19}$
-2
19
-18
1

(f) $3\frac{2}{5} \times 8 = \frac{17}{5} \times 8$

$= \frac{136}{5}$

$= 27\frac{1}{5}$

$5\overline{)\,136\,(27}$
-10
36
-35
1

Q7) Find:

(a) $\frac{1}{2}$ of (i) $2\frac{3}{4}$ (ii) $4\frac{2}{9}$

(b) $\frac{5}{8}$ of (i) $3\frac{5}{6}$ (ii) $9\frac{2}{3}$

Solution:

(a) (i) $\frac{1}{2}$ of $2\frac{3}{4} = \frac{1}{2} \times \frac{11}{4} = \frac{11}{8} = 1\frac{3}{8}$

(ii) $\frac{1}{2}$ of $4\frac{2}{9} = \frac{1}{\cancel{2}} \times \frac{\cancel{38}^{19}}{9} = \frac{19}{9} = 2\frac{1}{9}$

b) Try it yourself (both (i) and (ii)

Q8) Rozy and Tabasum went for a picnic. They purchased pizza from the market of weight of 200 gm. Rozy ate 3/5 of it. Tabassum ate the rest.

(i) How much did Tabasum ate?

(ii) What fraction of the total gm was taken by Tabassum?

Solution:

Pizza consumed by Rozy = $\frac{3}{5}$ of 200 gm.

$= \frac{3}{5} \times 200 = \frac{3x20}{5}$ gm = 3x40 gm = 120 gm.

Thus Pizza consumed by Tabassum in gm is

200 gm-120gm=80 gm

(ii) Fraction of Pizza consumed by Tabassum

$$= \frac{80}{200} = \frac{8}{20} = \frac{2}{5}$$

EXERCISE 2.3

Q1) Find:

(*i*) $\frac{1}{4}$ of (*a*) $\frac{1}{4}$ (*b*) $\frac{3}{5}$ (*c*) $\frac{4}{3}$

(*ii*) $\frac{1}{7}$ of (*a*) $\frac{2}{9}$ (*b*) $\frac{6}{5}$ (*c*) $\frac{3}{10}$

(iii) $\frac{1}{3}$ of (a) $\frac{3}{7}$ (b) $\frac{1}{3}$ (c) $\frac{12}{13}$

Solution:

(*i*) (*a*) $\frac{1}{4}$ of $\frac{1}{4} = \frac{1}{4} \times \frac{1}{4} = \frac{1 \times 1}{4 \times 4} = \frac{1}{16}$

(*b*) $\frac{1}{4}$ of $\frac{3}{5} = \frac{1}{4} \times \frac{3}{5} = \frac{1 \times 3}{4 \times 5} = \frac{3}{20}$

(*c*) $\frac{1}{4}$ of $\frac{4}{3} = \frac{1}{\cancel{4}} \times \frac{\cancel{4}}{3} = \frac{1}{3}$

(*ii*) (*a*) $\frac{1}{7}$ of $\frac{2}{9} = \frac{1}{7} \times \frac{2}{9} = \frac{1 \times 2}{7 \times 9} = \frac{2}{63}$

(*b*) $\frac{1}{7}$ of $\frac{6}{5} = \frac{1}{7} \times \frac{6}{5} = \frac{1 \times 6}{7 \times 5} = \frac{6}{35}$

(*c*) $\frac{1}{7}$ of $\frac{3}{10} = \frac{1}{7} \times \frac{3}{10} = \frac{1 \times 3}{7 \times 10} = \frac{3}{70}$

(iii) a, b and c (Try it yourself)

Q2) Multiply and reduce to lowest form (if possible):

(*i*) $\frac{2}{3}\times 2\frac{2}{3}$ (*ii*) $\frac{2}{7}\times\frac{7}{9}$ (*iii*) $\frac{3}{8}\times\frac{6}{4}$

(*iv*) $\frac{9}{5}\times\frac{3}{5}$ (*v*) $\frac{1}{3}\times\frac{15}{8}$ (*vi*) $\frac{11}{2}\times\frac{3}{10}$

(vii) $\frac{14}{5}$ X $\frac{12}{7}$ (viii) $\frac{3}{7}$ X $\frac{11}{9}$ (ix) $\frac{2}{7}$ x $\frac{21}{9}$ (x) $\frac{4}{5}$ x $\frac{40}{32}$

Solution:

(*i*) $\frac{2}{3}\times 2\frac{2}{3}=\frac{2}{3}\times\frac{8}{3}=\frac{2\times 8}{3\times 3}$

$=\frac{16}{9}=1\frac{7}{9}$

$9\overline{)16}\,(1$
-9
7

(*ii*) $\frac{2}{7}\times\frac{7}{9}=\frac{2\times 7}{7\times 9}=\frac{14}{63}=\frac{14\div 7}{63\div 7}=\frac{2}{9}$

(*iii*) $\frac{3}{8}\times\frac{6}{4}=\frac{3\times 6}{8\times 4}=\frac{18}{32}=\frac{18\div 2}{32\div 2}=\frac{9}{16}$

(*iv*) $\frac{9}{5}\times\frac{3}{5}=\frac{9\times 3}{5\times 5}=\frac{27}{25}=1\frac{2}{25}$

$25\overline{)27}\,(1$
-25
2

(*v*) $\frac{1}{3}\times\frac{15}{8}=\frac{1\times 15}{3\times 8}=\frac{15}{24}=\frac{15\div 3}{24\div 3}=\frac{5}{8}$

(*vi*) $\frac{11}{2}\times\frac{3}{10}=\frac{11\times 3}{2\times 10}=\frac{33}{20}=1\frac{13}{20}$

$20\overline{)33}\,(1$
-20
13

(vii) , (viii), (ix) and (x) (Try it yourself)

Q3) Multiply the following fractions:

(*i*) $\frac{2}{5}\times 5\frac{1}{4}$ (*ii*) $6\frac{2}{5}\times\frac{7}{9}$ (*iii*) $\frac{3}{2}\times 5\frac{1}{3}$

(*iv*) $\frac{5}{6}\times 2\frac{3}{7}$ (*v*) $3\frac{2}{5}\times\frac{4}{7}$ (*vi*) $2\frac{3}{5}\times 3$

(*vii*) $3\frac{4}{7}\times\frac{3}{5}$

(viii) $4\frac{3}{7}$ X $2\frac{4}{5}$ (ix) $3\frac{1}{5}$ X $4\frac{3}{3}$

Solution:

(i) $\frac{2}{5} \times 5\frac{1}{4} = \frac{\cancel{2}}{5} \times \frac{21}{\cancel{4}_2} = \frac{1 \times 21}{5 \times 2}$

$= \frac{21}{10} = 2\frac{1}{10}$

$10\overline{)21}\,(2$
-20
1

(ii) $6\frac{2}{5} \times \frac{7}{9} = \frac{32}{5} \times \frac{7}{9} = \frac{32 \times 7}{5 \times 9}$

$= \frac{224}{45} = 4\frac{44}{45}$

$45\overline{)224}\,(4$
-180
-44

(iii) $\frac{3}{2} \times 5\frac{1}{3} = \frac{\cancel{3}}{\cancel{2}} \times \frac{\cancel{16}^{8}}{\cancel{3}} = 8$

(iv) $\frac{5}{6} \times 2\frac{3}{7} = \frac{5}{6} \times \frac{17}{7} = \frac{85}{42} = 2\frac{1}{42}$

$42\overline{)85}\,(2$
-84
1

(v) $3\frac{2}{5} \times \frac{4}{7} = \frac{17}{5} \times \frac{4}{7} = \frac{68}{35} = 1\frac{33}{35}$

$35\overline{)68}\,(1$
-35
33

(vi) $2\frac{3}{5} \times 3 = \frac{13}{5} \times 3 = \frac{39}{5} = 7\frac{4}{5}$

$5\overline{)39}\,(7$
-35
4

(vii) $3\frac{4}{7} \times \frac{3}{5} = \frac{\cancel{25}^{5}}{7} \times \frac{3}{\cancel{5}} = \frac{5 \times 3}{7}$

$= \frac{15}{7} = 2\frac{1}{7}$

$7\overline{)15}\,(2$
-14
1

(viii) and (ix) (Try it yourself)

Q4) Which is greater:

(i) $\frac{2}{7}$ of $\frac{3}{4}$ or $\frac{3}{5}$ of $\frac{5}{8}$ (ii) $\frac{1}{2}$ of $\frac{6}{7}$ or $\frac{2}{3}$ of $\frac{3}{7}$

Solution:

(*i*) $\frac{2}{7}$ of $\frac{3}{4} = \frac{\cancel{2}}{7} \times \frac{3}{\cancel{4}_2} = \frac{1 \times 3}{7 \times 2} = \frac{3}{14}$

$\frac{3}{5}$ of $\frac{5}{8} = \frac{3}{\cancel{5}} \times \frac{\cancel{5}}{8} = \frac{3}{8}$

Since in $\frac{3}{14}$ and $\frac{3}{8}$, their numerators are same and $14 > 8$.

$\therefore \quad \frac{3}{14} < \frac{3}{8}$ or $\frac{3}{8} > \frac{3}{14}$

Hence, $\frac{3}{5}$ of $\frac{5}{8} > \frac{2}{7}$ of $\frac{3}{4}$

(*ii*) $\frac{1}{2}$ of $\frac{6}{7}$ or $\frac{2}{3}$ of $\frac{3}{7}$

$\frac{1}{2}$ of $\frac{6}{7} = \frac{1}{2} \times \frac{6}{7} = \frac{1 \times 6}{2 \times 7} = \frac{\cancel{6}^3}{\cancel{14}_7} = \frac{3}{7}$

$\frac{2}{3}$ of $\frac{3}{7} = \frac{2}{\cancel{3}} \times \frac{\cancel{3}}{7} = \frac{2}{7}$

Here, denominators are same.

$\therefore \quad \frac{2}{7} < \frac{3}{7}$ or $\frac{3}{7} > \frac{2}{7}$

Hence, $\frac{1}{2}$ of $\frac{6}{7} > \frac{2}{3}$ of $\frac{3}{7}$

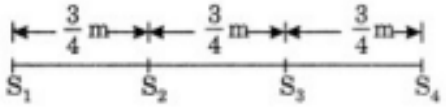
Q5) Saika plants 4 saplings, in a row, in her garden. The distance between two adjacent saplings is 3/4 m. Find the distance between the first and the last sapling.

Solution:

Number of saplings = 4

Distance between two adjacent saplings = 3/4 m

∴ Distance between the first and the last sapling



$= \frac{3}{4}$ m $+ \frac{3}{4}$ m $+ \frac{3}{4}$ m $= 3 \times \frac{3}{4}$ m

$= \frac{9}{4}$ m $= 2\frac{1}{4}$ m

Q6) Aliya reads a book for $1\frac{3}{4}$ hours everyday. She reads the entire book in 6 days. How many hours in all were required by her to read the book?

Solution:

In 1 day Aliya reads $1\frac{3}{4}$ hours

In 6 days, she will read $6 \times 1\frac{3}{4}$ hours

$= {}^{3}\cancel{6} \times \frac{7}{\cancel{4}_{2}}$ hours $= \frac{3 \times 7}{2}$ hours

$= \frac{21}{2}$ hours $= 10\frac{1}{2}$ hours

Hence the required hours $= 10\frac{1}{2}$ hours.

EXERCISE 2.4

Q1) Find:

(*i*) $12 \div \frac{3}{4}$ (*ii*) $14 \div \frac{5}{6}$ (*iii*) $8 \div \frac{7}{3}$

(*iv*) $4 \div \frac{8}{3}$ (*v*) $3 \div 2\frac{1}{3}$ (*vi*) $5 \div 3\frac{4}{7}$

vii) $3\frac{1}{2} \div 2\frac{1}{3}$ viii) $\frac{7}{13} \div 6\frac{1}{2}$

Solution:

(*i*) $12 \div \frac{3}{4} = \cancel{12}^{4} \times \frac{4}{\cancel{3}} = 4 \times 4 = 16$

(*ii*) $14 \div \frac{5}{6} = 14 \times \frac{6}{5}$

$= \frac{84}{5} = 16\frac{4}{5}$

$5\overline{)84}\,(16$
-5
34
-30
4

(*iii*) $8 \div \frac{7}{3} = 8 \times \frac{3}{7} = \frac{24}{7} = 3\frac{3}{7}$

$7\overline{)24}\,(3$
-21
3

(*iv*) $4 \div \frac{8}{3} = \cancel{4} \times \frac{3}{\cancel{8}_{2}} = \frac{3}{2} = 1\frac{1}{2}$

$2\overline{)3}\,(1$
-2
1

(*v*) $3 \div 2\frac{1}{3} = 3 \div \frac{7}{3} = 3 \times \frac{3}{7}$

$= \frac{9}{7} = 1\frac{2}{7}$

$7\overline{)9}\,(1$
-7
2

(*vi*) $5 \div 3\frac{4}{7} = 5 \div \frac{25}{7} = \cancel{5}^{1} \times \frac{7}{\cancel{25}_{5}}$

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

$5\overline{)7}\,(1$
-5
2

(vii) and (viii) (Try it yourself)

Q2) Find the reciprocal of each of the following fractions. Classify the reciprocals as proper fractions, improper fractions and whole numbers.

(*i*) $\frac{3}{7}$ (*ii*) $\frac{5}{8}$ (*iii*) $\frac{9}{7}$ (*iv*) $\frac{6}{5}$

(*v*) $\frac{12}{7}$ (*vi*) $\frac{1}{8}$ (*vii*) $\frac{1}{11}$

(viii) $\frac{2}{3}$ (ix) $\frac{2}{3} \div \frac{3}{2}$ (ix) $\frac{2}{3} \div \frac{3}{2}$ (x) $\frac{4}{5} \times 1\frac{1}{4}$

(i) Reciprocal of 3/7=7/3, which is improper fraction.
(ii) Reciprocal of 5/8=8/5, which is improper fraction.
(iii) Reciprocal of 9/7=7/9, which is proper fraction.
(iv) Reciprocal of 6/5=5/6, which is proper fraction.
(vi) Reciprocal of 12/7=7/12, which is proper fraction.
(vi) Reciprocal of 1/8=8, which is whole number.
(vii) Reciprocal of 1/11=11, which is whole number.

(viii) , (ix) and (x) (Try it yourself)

Q3) Find:

(*i*) $\frac{7}{3} \div 2$ (*ii*) $\frac{4}{9} \div 5$ (*iii*) $\frac{6}{13} \div 7$

(*iv*) $4\frac{1}{3} \div 3$ (*v*) $3\frac{1}{2} \div 4$ (*vi*) $4\frac{3}{7} \div 7$

Solution:

(*i*) $\frac{7}{3} \div 2 = \frac{7}{3} \times \frac{1}{2} = \frac{7}{6} = 1\frac{1}{6}$

$6\overline{)7}(1$
-6
1

(*ii*) $\frac{4}{9} \div 5 = \frac{4}{9} \times \frac{1}{5} = \frac{4}{45}$

(*iii*) $\frac{6}{13} \div 7 = \frac{6}{13} \times \frac{1}{7} = \frac{6}{91}$

(*iv*) $4\frac{1}{3} \div 3 = \frac{13}{3} \div 3 = \frac{13}{3} \times \frac{1}{3}$

$= \frac{13}{9} = 1\frac{4}{9}$

$9\overline{)13}(1$
-9
4

(*v*) $3\frac{1}{2} \div 4 = \frac{7}{2} \div 4 = \frac{7}{2} \times \frac{1}{4} = \frac{7}{8}$

(*vi*) $4\frac{3}{7} \div 7 = \frac{31}{7} \div 7 = \frac{31}{7} \times \frac{1}{7} = \frac{31}{49}$

Q4) Find:

(*i*) $\frac{2}{5} \div \frac{1}{2}$ (*ii*) $\frac{4}{9} \div \frac{2}{3}$ (*iii*) $\frac{3}{7} \div \frac{8}{7}$

(*iv*) $2\frac{1}{3} \div \frac{3}{5}$ (*v*) $3\frac{1}{2} \div \frac{8}{3}$ (*vi*) $\frac{2}{5} \div 1\frac{1}{2}$

(*vii*) $3\frac{1}{5} \div 1\frac{2}{3}$ (*viii*) $2\frac{1}{5} \div 1\frac{1}{5}$

(ix) $3\frac{1}{2} \div 1\frac{1}{6}$ (x) $\frac{3}{8} \div 2\frac{2}{3}$

Solution:

(*i*) $\frac{2}{5} \div \frac{1}{2} = \frac{2}{5} \times \frac{2}{1} = \frac{4}{5}$

(*ii*) $\frac{4}{9} \div \frac{2}{3} = \frac{\cancel{4}^{2}}{\cancel{9}_{3}} \times \frac{\overset{1}{\cancel{3}}}{\underset{1}{\cancel{2}}} = \frac{2}{3}$

(*iii*) $\frac{3}{7} \div \frac{8}{7} = \frac{3}{\cancel{7}} \times \frac{\cancel{7}}{8} = \frac{3}{8}$

(*iv*) $2\frac{1}{3} \div \frac{3}{5} = \frac{7}{3} \div \frac{3}{5} = \frac{7}{3} \times \frac{5}{3}$

$= \frac{35}{9} = 3\frac{8}{9}$

$9\overline{)35}\,(3$
-27
8

(*v*) $3\frac{1}{2} \div \frac{8}{3} = \frac{7}{2} \div \frac{8}{3} = \frac{7}{2} \times \frac{3}{8}$

$= \frac{21}{16} = 1\frac{5}{16}$

$16\overline{)21}\,(1$
-16
5

(*vi*) $\frac{2}{5} \div 1\frac{1}{2} = \frac{2}{5} \div \frac{3}{2} = \frac{2}{5} \times \frac{2}{3} = \frac{4}{15}$

(*vii*) $3\frac{1}{5} \div 1\frac{2}{3} = \frac{16}{5} \div \frac{5}{3} = \frac{16}{5} \times \frac{3}{5}$

$= \frac{48}{25} = 1\frac{23}{25}$

$25\overline{)48}\,(1$
-25
23

(*viii*) $2\frac{1}{5} \div 1\frac{1}{5} = \frac{11}{5} \div \frac{6}{5} = \frac{11}{\cancel{5}} \times \frac{\cancel{5}}{6}$

$= \frac{11}{6} = 1\frac{5}{6}$

$6\overline{)11}\,(1$
-6
5

(ix) and (x) (Try it yourself)

EXERCISE 2.5

Q1) Which is greater?
(i) 0.5 or 0.05
(ii) 0.7 or 0.5
(iii) 7 or 0.7
(iv) 1.37 or 1.49
(v) 2.03 or 2.30
(vi) 0.8 or 0.88
Solution:
(i) 0.5 or 0.05
Comparing the tenths place, we get $5 > 0$
$\therefore 0.5 > 0.05$

(ii) 0.7 or 0.5
Comparing the tenths place, we get $7 > 5$
$\therefore 0.7 > 0.5$

(iii) 7 or 0.7
Comparing the one's place, we get $7 > 0$
$\therefore 7 > 0.7$

(iv) 1.37 or 1.49
Comparing the tenths place, we get $3 < 4$
$\therefore 1.37 < 1.49$ or $1.49 > 1.37$

(v) 2.03 or 2.30
Comparing the tenths place, we get $0 < 3$
$\therefore 2.03 < 2.30$ or $2.30 > 2.03$

(vi) 0.8 or $0.88 \Rightarrow 0.80$ or 0.88
Since tenths place is same.
Comparing the hundredth place, we get $0 < 8$
$\therefore 0.80 < 0.88$ or $0.88 > 0.80$

Q2) Express as rupees using decimals:
(i) 7 paise
(ii) 7 rupees 7 paise
(iii) 77 rupees 77 paise
(iv) 50 paise

(v) 235 paise

Solution:

(i) Since 1 rupee = 100 paise and 1 paise = 1/100 rupees

7 paise =7/100 rupees = 0.07 rupees

(ii) 7 rupees 7 paise = 7 rupees + 7/100 rupees

= 7.07 rupees

(iii) 77 rupees 77 paise = 77 rupees + 77/100 rupees

= 77.77 rupees

(iv) 50 paise = 50/100 rupees = 0.50 rupees

(v) 235 paise = 235/100 rupees = 2.35 rupees

Q3) (i) Express 5 cm in metre and kilometre

(ii) Express 35 mm in cm, m and km.

Solution:

(i) 1 metre = 100 cm i.e 1cm = 1/100 m

1 kilometre = 1000 metre = 100 × 1000 cm

= 100000 cm i.e 1 cm = 1/ 100000 km

∴ 5 cm = 5/100 metre = 0.05 metre

5 cm = 5/100000 km = 0.00005 km

Hence, 5 cm = 0.05 m and 0.00005 km

(ii) 1 cm = 10 mm and 1 km = 100000 cm

∴ 35 mm = 35/10 cm = 3.5 cm,

35 mm = 35/1000 m = 0.035 m

35 mm = 35/1000000 km = 0.000035 km

Hence, 35 mm = 3.5 cm, 0.035 m and 0.000035 km.

Q4) Express in kg:

(i) 200 g

(ii) 3470 g

(iii) 4 kg 8 g

Solution:

(i) 200g = 200/1000 kg [∵ 1 kg = 1000g]

= 0.2 kg

(ii) 3470 g = 3470/1000 kg = 3.47 kg [∵ 1 kg = 1000 g]

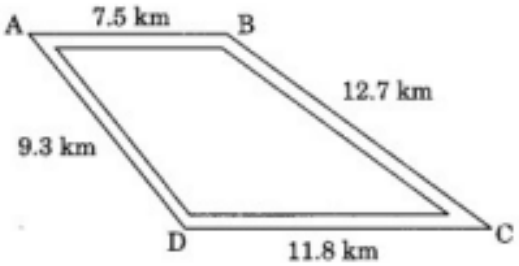
(iii) 4 kg 8 g = 4 kg + 8/1000kg [∵ 1 kg = 1000 g]

= 4 kg + 0.008 kg = 4.008 kg

Q5) Write the following decimal numbers in the expanded form:
(i) 20.03
(ii) 2.03
(iii) 200.03
Solution:
(i) $20.03 = 2 \times 10 + 0 \times 1 + 0 \times 1/10 + 3 \times 1/100$
(ii) $2.03 = 2 \times 1 + 0 \times 1/10 + 3 \times 1/100$
(iii) $200.03 = 2 \times 100 + 0 \times 10 + 0 \times 1 + 0 \times 1/10 + 3 \times 1/100$

Q6) Write the place value of 2 in the following decimal numbers:
(i) 2.56
(ii) 21.37
(iii) 10.25
(iv) 9.42
(v) 63.352
Solution:
(i) Place value of 2 in $2.56 = 2 \times 1 = 2$ i.e. ones
(ii) Place value of 2 in $21.37 = 2 \times 10 = 20$ i.e. tens
(iii) Place value of 2 in $10.25 = 2/10 = 0.2$ i.e. tenths
(iv) Place value of 2 in $9.42 = 2/100 = 0.02$ i.e. hundredths
(v) Place value of 2 in $63.352 = 2/1000 = 0.002$ i.e. thousandths.

Q7) Arif went from place A to place B and from there to place C. A is 7.5 km from B and B is 12.7 km from C. Rameez went from place A to place D and from there to place C. D is 9.3 km from A and C is 11.8 km from D. Who travelled more and by how much?
Solution:
Distance travelled by Arif from A to C
= AB + BC
= 7.5 km +- 12.7 km
= 20.2 km



Distance travelled by Rameez from A to C

= AD + DC
= 9.3 km + 11.8 km = 21.1 km
Since 21.1 km > 20.2 km.
Hence, Rameez travelled more distance by 21.1-20.2=0.9 km.

EXERCISE 2.6

Q1) Find:
(i) 0.2 × 6 (ii) 8 × 4.6 (iii) 2.71 × 5 (iv) 20.1 × 4 (v) 0.05 × 7
(vi) 211.02 × 4 (vii) 2 × 0.86 (viii) 10.35 × 4 (ix)209.07 × 12 (x) 467.3 × 4

Solution:
(i) 0.2 × 6
∵ 2 × 6 = 12 and we have 1 digit right to the decimal point in 0.2.
Thus 0.2 × 6 = 1.2

(ii) 8 × 4.6
∵ 8 × 46 = 368 and there is one digit right to the decimal point in 4.6.
Thus 8 × 4.6 = 36.8

(iii) 2.71 × 5
∵ 271 × 5 = 1355 and there are two digits right to the decimal point in 2.71.
Thus 2.71 × 5 = 13.55

(iv) 20.1 × 4
∵ 201 × 4 = 804 and there is one digit right to the decimal point in 20.1.
∵ 20.1 × 4 = 80.4

(v) 0.05 × 7
∵ 5 × 7 = 35 and there are 2 digits right to the decimal point in 0.05.
Thus 0.05 × 7 = 0.35

(vi) 211.02 × 4
∵ 21102 × 4 = 84408 and there are 2 digits right to the decimal point in 211.02.
Thus 211.02 × 4 = 844.08

(vii) 2 × 0.86
∵ 2 × 86 = 172 and there are 2 digits right to the decimal point in 0.86.
Thus 2 × 0.86 = 1.72

(Viii) , (ix) and (x) (Try it yourself)

Q2) (i) Find the area of rectangle whose length is 5.7 cm and breadth is 3 cm.

ii) Find the area of square whose side is 12,5 cm

Solution:

i)Length = 5.7 cm
Breadth = 3 cm
Area of rectangle = length × breadth
= 5.7 × 3 = 17.1 cm^2
Hence, the required area =17.1 cm^2

(ii) side of the square= 12.5 cm

Area of square = side × side = 12.5 ×12.5=156.25 cm^2

Q3) Find:
(i) 1.3 × 10 (ii) 36.8 × 10 (iii) 153.7 × 10 (iv) 168.07 × 10 (v) 31.1 × 100
(vi) 156.1 × 100 (vii) 3.62 × 100 (viii) 43.07 × 100

Solution:

$(i)\ 1.3 \times 10 = \frac{13}{\cancel{10}} \times \cancel{10} = 13$

$(ii)\ 36.8 \times 10 = \frac{368}{\cancel{10}} \times \cancel{10} = 368$

$(iii)\ 153.7 \times 10 = \frac{1537}{\cancel{10}} \times \cancel{10} = 1537$

$(iv)\ 168.07 \times 10 = \frac{16807}{10\cancel{0}} \times \cancel{10} = 1680.7$

$(v)\ 31.1 \times 100 = \frac{311}{\cancel{10}} \times 10\cancel{0}$

$= 311 \times 10 = 3110$

$(vi)\ 156.1 \times 100 = \frac{1561}{\cancel{10}} \times 10\cancel{0}$

$= 1561 \times 10 = 15610$

$(vii)\ 3.62 \times 100 = \frac{362}{\cancel{100}} \times \cancel{100} = 362$

$(viii)\ 43.07 \times 100 = \frac{4307}{\cancel{100}} \times \cancel{100} = 4307$

Q4) A two-wheeler covers a distance of 55.3 km in one litre of petrol. How much distance will it cover is 10 litres of petrol?
Solution:

Distance covered in 1 litre = 55.3 km

Distance covered in 10 litres = 55.3 × 10 km

$= \frac{553}{1\cancel{0}} \times 1\cancel{0}$ km = 553 km

Hence, the required distance = 553 km

Q5) Find:

(i) 2.5 ×0.3 (ii) 0.1 × 51.7 (iii) 0.2 × 316.8 (iv) 1.3 × 3.1(v) 0.5 × 0.05

(vi)11.2 x0.15 (vii) 1.07 x 0.02 (viii) 10.5 x 1.05 (ix) 101.01 x 0.01 (x)100.01x1.1

Solution:

(i) 0 2.5 × 0.3

$= \frac{25}{10} \text{ x } \frac{3}{10} = \frac{75}{100} = 0.75$

(ii) 0.1 × 51.7

$= \frac{1}{10} \text{ x } \frac{517}{10} = \frac{517}{100} = 5.17$

iii) 0.2 × 316.8

$= \frac{2}{10} \text{ x } \frac{3168}{10} = \frac{6336}{100} = 63.36$

iv) 1.3 x 3.1

$= \frac{13}{10} \text{ x } \frac{31}{10} = \frac{403}{100} = 4.03$

(v) 0.5 × 0.05

$= \frac{5}{10} \text{ x } \frac{5}{100} = \frac{25}{1000} = 0.025$

(vi) to (x) Try it yourself

EXERCISE 2.7

Q1) Find:

(i) 0.4 ÷ 2 ii) 0.35 ÷ 5 (iii) 2.48 ÷ 4 (iv) 65.4 ÷ 6 (v) 651.2 ÷ 4

(vi) 14.49 ÷ 7 (vii) 3.96 ÷ 4 (viii) 0.08 ÷ 5 (ix) 448 ÷ 0.7 (x) 73.6 ÷ 4

Solution:

$$(i)\ 0.4 \div 2 = \frac{4}{10} \div 2 = \frac{4}{10} \times \frac{1}{2} = \frac{1}{10} \times \frac{4}{2}$$
$$= \frac{1}{10} \times 2 = 0.2$$

$$(ii)\ 0.35 \div 5 = \frac{35}{100} \div 5 = \frac{35}{100} \times \frac{1}{5}$$
$$= \frac{1}{100} \times \frac{35}{5} = \frac{1}{100} \times 7 = 0.07$$

$$(iii)\ 2.48 \div 4 = \frac{248}{100} \div 4 = \frac{248}{100} \times \frac{1}{4}$$
$$= \frac{1}{100} \times \frac{248}{4} = \frac{1}{100} \times 62 = 0.62$$

$$(iv)\ 65.4 \div 6 = \frac{654}{10} \div 6 = \frac{654}{10} \times \frac{1}{6}$$
$$= \frac{1}{10} \times \frac{654}{6} = \frac{1}{10} \times 109 = 10.9$$

$$(v)\ 651.2 \div 4 = \frac{6512}{10} \div 4 = \frac{6512}{10} \times \frac{1}{4}$$
$$= \frac{1}{10} \times \frac{6512}{4} = \frac{1}{10} \times 1628 = 162.8$$

$$(vi)\ 14.49 \div 7 = \frac{1449}{100} \div 7 = \frac{1449}{100} \times \frac{1}{7}$$
$$= \frac{1}{100} \times \frac{1449}{7} = \frac{1}{100} \times 207 = 2.07$$

(vii) to (x) Do it yourself

Q2) Find:

(i) 4.8 ÷ 10	(ii) 52.5 ÷ 10	(iii) 0.7 ÷ 10	(iv) 33.1 ÷ 10
(v) 272.23 ÷ 10	vi) 0.56 ÷ 10	(vii) 3.97 ÷10	(viii) 3.069 ÷10
(ix) 43.3 ÷100	(x) 0.5 ÷10		

Solution:

(i) 4.8 ÷ 10 = 0.48 (Shifting the decimal point to the left by 1 place)

(ii) 52.5 ÷ 10 = 5.25 (Shifting the decimal point to the left by 1 place)

(iii) 0.7 ÷ 10 = 0.07 (Shifting the decimal point to the left by 1 place)

(iv) 33.1 ÷ 10 = 3.31 (Shifting the decimal point to the left by 1 place)

(v) 272.23 ÷ 10 = 27.223 (Shifting the decimal point to the left by 1 place)

(vi) 0.56 ÷ 10 = 0.056(Shifting the decimal point to the left by 1 place)

(vii) 3.97 ÷ 10 = 0.397(Shifting the decimal point to the left by 1 place)

(Viii) 3.069 ÷ 10 = 0.3069 (Shifting the decimal point to the left by 1 place)

(ix) 43.3 ÷ 100 = 0.433(Shifting the decimal point to the left by 2 place)

(x) 0.5 ÷ 10 = 0.05 (Shifting the decimal point to the left by 1 place)

Q3) Find:
(i) 2.7 ÷ 100
(ii) 0.3 ÷ 100
(iii) 0.78 ÷ 100
(iv) 432.6 ÷ 100
(v) 23.6 ÷ 100
(vi) 98.53 ÷ 100
Solution:
(i) 2.7 ÷ 100 = 0.027(Shifting the decimal point to the left by 2 places)
(ii) 0.3 ÷ 100 = 0.003(Shifting the decimal point to the left by 2 places)
(iii) 0.78 ÷ 100 = 0.0078 (Shifting the decimal point to the left by 2 places)
(iv) 432.6 ÷ 100 = 4.326 (Shifting the decimal point to the left by 2 places)
(v) 23.6 ÷ 100 = 0.236 (Shifting the decimal point to the left by 2 places)
(vi) 98.53 ÷ 100 = 0.9853 (Shifting the decimal point to the left by 2 places)

Q4) Find:
(i) 7.9 ÷ 1000
(ii) 26.3 ÷ 1000
(iii) 38.53 ÷ 1000
(iv) 128.9 ÷ 1000
(v) 0.5 ÷ 1000
Solution:
(i) 7.9 ÷ 1000 = 0.0079 (Shifting the decimal point to the left by 3 places)
(ii) 26.3 ÷ 1000 = 0.0263 (Shifting the decimal point to the left by 3 places)
(iii) 38.53 ÷ 1000 = 0.03853 (Shifting the decimal point to the left by 3 places)
(iv) 128.9 ÷ 1000 = 0.1289 (Shifting the decimal point to the left by 3 places)
(v) 0.5 ÷ 1000 = 0.0005 (Shifting the decimal point to the left by 3 places)

Q5) Find:
(i) 7 ÷ 3.5
(ii) 36 ÷ 0 .2
(iii) 3.25 ÷ 0.5
(iv) 30.94 ÷ 0.7
(v) 0.5 ÷ 0.25
(vi) 7.75 ÷ 0.25
(vii) 76.5 ÷ 0.15

(viii) 37.8 ÷ 1.4

(ix) 2.73 ÷ 1.3

Solution:

$(i)\ 7 \div 3.5 = \frac{7}{3.5} = \frac{70}{35} = 2$

$(ii)\ 36 \div 0.2 = \frac{36}{0.2} = \frac{360}{2} = 180$

$(iii)\ 3.25 \div 0.5 = \frac{3.25}{0.5} = \frac{325}{50} = \frac{1}{10} \times \frac{325}{5}$

$= \frac{1}{10} \times 65 = 6.5$

$(iv)\ 30.94 \div 0.7 = \frac{30.94}{0.7} = \frac{3094}{70} = \frac{1}{10} \times \frac{3094}{7}$

$= \frac{1}{10} \times 442 = 44.2$

$(v)\ 0.5 \div 0.25 = \frac{0.5}{0.25} = \frac{50}{25} = 2$

$(vi)\ 7.75 \div 0.25 = \frac{7.75}{0.25} = \frac{775}{25} = 31$

$(vii)\ 76.5 \div 0.15 = \frac{76.5}{0.15} = \frac{7650}{15} = 510$

$(viii)\ 37.8 \div 1.4 = \frac{37.8}{1.4} = \frac{378}{14} = 27$

$(ix)\ 2.73 \div 1.3 = \frac{2.73}{1.3} = \frac{2.73}{1.30} = \frac{273}{130}$

$= \frac{1}{10} \times \frac{273}{13} = \frac{1}{10} \times 21 = 2.1$

Q6) A vehicle covers a distance of 43.2 km in 2.4 litres of Petrol. How much distance will it cover in one litre of petrol?

Solution:

2.4 litres of petrol is required to cover 43.2 km distance

$\therefore$ 1 litre of petrol will be required to cover = $\frac{43.2}{2.4}$

$= \frac{43.2}{2.4}$ km distance

$= \frac{432}{24}$ km = 18 km

Hence, the required distance = 18 km

Data Handling

Exercise 3.1

Q1) Find the range of heights of any ten students of your class.

Sol) Let us have the heights of 10 students are as follows:

140 cm, 141.5 cm, 138 cm, 150 cm, 161 cm,138 cm, 140.5 cm, 135.5 cm, 160 cm, 158 cm

Here, minimum height = 135.5 cm

Maximum height =161 cm

∴ Range = Maximum height – Minimum height

= 161 cm — 135.5 cm = 25.5 cm

Hence, the required range = 25.5 cm.

Q2) Organise the following marks in a class assessment in a tabular form.

4, 6, 7, 5, 3, 5, 4, 5, 2, 6, 2, 5, 1, 9, 6, 5, 8, 4, 6, 7

(i) Which number is the highest?

(ii) Which number is the lowest?

(iii) What is the range of the data?

(iv) Find the arithmetic mean.

Sol) Let us form a frequency distribution table:

Marks (x_i)	Tally marks	Frequency (f_i)	$f_i x_i$
1	|	1	1
2	||	2	4
3	|	1	3
4	|||	3	12
5	𝍸	5	25
6	||||	4	24
7	||	2	14
8	|	1	8
9	|	1	9
		20	100

(i) 9 is the highest marks.

(ii) 1 is the lowest marks.

(iii) Range = Max. marks – Min. marks = 9 – 1 = 8

(iv) Arithmetic mean = sum of all observations / number of observations

$$= 100/20 = 5$$

Q3) Find the mean of first five whole numbers.

Sol) First 5 whole numbers are 0, 1, 2, 3, 4

$\therefore$ Mean $= \frac{0+1+2+3+4}{5} = \frac{10}{5} = 2$

Hence, the required mean = 2.

Q 4). A cricketer scores the following runs in eight innings: 58, 76, 40, 35, 46, 45, 0, 100. Find the mean score.

Sol) Following are the scores of the runs in eight innings:58, 76, 40, 35, 46, 45, 0, 100

$\therefore$ Mean = Sum of all runs / Number of innings

$=(58+76+40+35+46+45+0+100) \div 8 = 400 \div 8 = 50$

Hence, the required mean = 50.

Q5) Following table shows the points of each player scored in four games:

Player	**Game 1**	**Game 2**	**Game 3**	**Game 4**
A	14	16	10	10
B	0	8	6	4
C	8	11	Did not play	13

Now answer the following questions:

(i) Find the mean to determine A's average number of points scored per game.

(ii) To find the mean number of points per game for C, would you divide the total points by 3 or by 4? Why?

(iii) B played in all the four games. How would you find the mean?

(iv) Who is the best performer?

Sol) (i) Number of points scored by A in all games are

Game 1 = 14, Game 2 = 16, Game 3 = 10, Game 4 = 10

$\therefore$ Average score $= (14+16+10+10) \div 4$

$=50 \div 4 = 12.5$

(ii) Since, C did not play Game 3, he played only 3 games. So, the total will be divided by 3.

(iii) Number of points scored by B in all the games are Game 1 = 0, Game 2 = 8, Game 3 = 6, Game 4 = 4

∴ Average score = (0+8+6+4) ÷ 4 = 18 ÷ 4 = 4.5

(iv) Mean score of C = (8+11+13) ÷ 3 = 32 ÷ 3 = 10.67

Mean score of C = 10.67

While mean score of A = 12.5

Clearly, A is the best performer.

Q6) The marks (out of 100) obtained by a group of students in a science test are 85, 76, 90, 85, 39, 48, 56, 95, 81 and 75. Find the

(i) highest and the lowest marks obtained by the students.

(ii) range of the marks obtained.

(iii) mean marks obtained by the group.

Sol) Marks obtained are: 85, 76, 90, 85, 39, 48, 56, 95, 81 and 75

(i) Highest marks = 95

Lowest marks = 39

(ii) Range of the marks = Highest marks – Lowest marks

= 95 – 39 = 56

(iii) Mean marks

$$= \frac{\text{Sum of all marks obtained}}{\text{Number of students}}$$

$$= \frac{85 + 76 + 90 + 85 + 39 + 48 + 56 + 95 + 81 + 75}{10}$$

$$= \frac{730}{10} = 73$$

Q7) The enrolment in a school during six consecutive years was as follows: 1555, 1670, 1750, 2013, 2540, 2820. Find the mean enrolment of the school for this period.

Sol) Mean enrolment

$$= \frac{\text{Sum of the enrolments of all years}}{\text{Number of years}}$$

$$= \frac{1555 + 1670 + 1750 + 2013 + 2540 + 2820}{6}$$

$$= \frac{12348}{6} = 2058$$

Thus, the required mean = 2058.

Q8)The rainfall (in mm) in a city on 7 days of a certain week was recorded as follows:

Day	Rainfall (in mm)
Monday	0.0
Tuesday	12.2
Wednesday	2.1
Thursday	0.0
Friday	20.5
Saturday	5.5
Sunday	1.0

(i) Find the range of the rainfall in the above data.
(ii) Find the mean rainfall for the week.
(iii) On how many days was the rainfall less than the mean rainfall?
Sol) (i) Maximum rainfall = 20.5 mm
Minimum rainfall = 0.0 mm
∴ Range = Maximum rainfall – Minimum rainfall
= 20.5 mm – 0.0 mm = 20.5 mm

(ii) Mean rainfall

$$= \frac{\text{Sum of rainfalls (in mm)}}{\text{Number of days}}$$

$$= \frac{0.0 + 12.2 + 2.1 + 0.0 + 20.5 + 5.5 + 1.0}{7}$$

$$= \frac{41.3}{7} \text{ mm} = 5.9 \text{ mm.}$$

(ii) Number of days on which the rainfall was less than the mean rainfall = Monday, Wednesday, Thursday, Saturday, Sunday = 5 days.

Q9) The heights of 10 girls were measured in cm and the results are as follows:
135, 150, 139, 128, 151, 132, 146, 149, 143, 141
(i) What is the height of the tallest girl?
(ii) What is the height of the shortest girl?
(iii) What is the range of the data?
(iv) What is the mean height of the girls?
(v) How many girls have heights more than the mean height?

Sol) (i) Height of the tallest girl = 151 cm.
(ii) Height of the shortest girl = 128 cm.
(iii) Range = Height of tallest girl – Height of the shortest girl
= 151 cm – 128 cm = 23 cm.

$$(iv)\ \text{Mean height} = \frac{\text{Sum of all heights}}{\text{Number of girls}}$$

$$= \frac{135 + 150 + 139 + 128 + 151 + 132 + 146 + 149 + 143 + 141}{10}$$

$$= \frac{1414}{10} = 141.4 \text{ cm}$$

(v) Number of girls having more height than the mean height
= 150, 151, 146, 149 and 143 = 5 girls

Exercise 3.2

Q1) The scores in mathematics test (out of 25) of 15 students is as follows:
19, 25, 23, 20, 9, 20, 15, 10, 5, 16, 25, 20, 24, 12, 20
Find the mode and median of this data. Are they same?

Sol) Given data:19, 25, 23, 20, 9, 20, 15, 10, 5, 16, 25, 20, 24, 12, 20
Let us arrange the given data in increasing order

5, 9, 10, 12, 15, 16, 19, 20, 20, 20, 20, 23, 24, 25, 25

Since 20 occurs 4 times (highest)
∴ Mode = 20
n = 15 (odd)
∴ Median = {(n+1) ÷ 2}th term = (15+1) ÷ 2 = 8th term = 20
Thus, median = 20 and mode = 20
∴ Mode and median are same

Q2) The runs scored in a cricket match by 11 players is as follows:
6, 15, 120, 50, 100, 80, 10, 15, 8, 10, 15
Find the mean, mode and median of this data. Are the three same?
Sol) Given data: 6, 15, 120, 50, 100, 80, 10, 15, 8, 10, 15

$$\text{Mean} = \frac{\text{Sum of all the numbers}}{\text{Number of terms}}$$

$$= \frac{6+15+120+50+100+80+10+15+8+10+15}{11}$$

$$= \frac{429}{11} = 39$$

Arranging the given data in increasing order, we get

6, 8, 10, 10, 15, 15, 15, 50, 80, 100, 120

Here, 15 occurs 3 times (highest)
∴ Mode = 15
n = 11 (odd)
∴ Median = {(11+1) ÷ 2}th term = 6th term = 15
Thus mean = 39, mode = 15 and median = 15
No, they are not same.

Q3) The weights (in kg) of 15 students of a class are:
38, 42, 35, 37, 45, 50, 32, 43, 43, 40, 36, 38, 43, 38, 47
(i) Find the mode and median of this data.
(ii) Is there more than one mode?
Sol) Given data: 38, 42, 35, 37,45, 50, 32,43, 43,40, 36, 38, 43, 38, 47
Arranging in increasing order, we get

32, 35, 36, 37, 38, 38, 38, 40, 42, 43, 43, 43, 45, 47, 50

(i) Here, 38 and 42 occur 3 times (highest)
Thus mode = 38 and 43
n = 15(odd)
Median = {(n+1)÷ 2}th term =(15+1/2)th term= 8th term = 40
Thus mode 38 and 43 and median = 40
(ii) Yes, the given data has two modes i.e. 38 and 43.

Q4) Find the mode and median of the data:13, 16, 12, 14, 19, 12, 14, 13, 14

Sol) Arranging the given data in increasing order, we get

12, 12, 13, 13, 14, 14, 14, 16, 19

Here, 14 occur 3 times (highest)

Thus, mode = 14

n = 9(odd)

∴ Median = {(n+1)÷ 2}th term =(9+1/2) th term= 5th term = 14

Hence, mode = 14 and median = 14.

Q5) Tell whether the statement is true or false.

(i) The mode is always one of the number in a data.

(ii) The mean is one of the numbers in a data.

(iii) The median is always one of the numbers in a data.

(iv) The data 6, 4, 3, 8, 9, 12, 13, 9 has mean 9.

Sol)

(i) True

(ii) False

(iii) True

(iv) False

Exercise 3.3

Q1) Use the bar graph to answer the following questions.

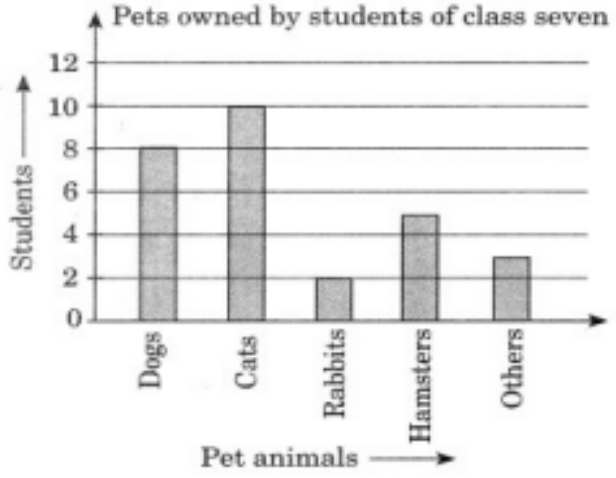
(a) Which is the most popular pet?

(b) How many students have dog as a pet?

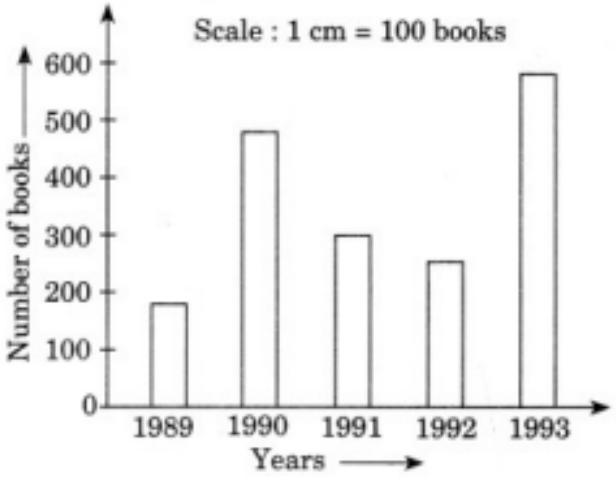
Sol) From the given bar graph in figure, we have

(a) Cats are the most popular pet among the students.

(b) 8 students have dog as a pet animal.



Q2) Read the bar graph which shows the number of books sold by a bookstore during five consecutive years and answer the following questions:
(i) About how many books were sold in 1989, 1990, 1992?
(ii) In which year were about 475 books sold? About 225 books sold?
(iii) In which year were fewer than 250 books sold?
(iv) Can you explain how you would estimate the number of books sold in 1989?



Sol)
From the given bar graph, we have
(i) Number of books sold in the year 1989 is about 180, in 1990 is about 490 and in 1992 is about 295.
(ii) About 475 books were sold in 1990. About 225 books were sold in the year 1992.
(iii) Fewer than 250 books were sold in the years 1989 and 1992.
(iv) On y-axis, the line is divided into 10 small parts of 10 books each. So, we can estimate the number of books sold in 1989 is about 180.

Q3) Number of children in six different classes are given below. Represent the data on a bar graph.

Class	**Number of children**
Fifth	135
Sixth	120
Seventh	95
Eighth	100

Ninth	90
Tenth	80

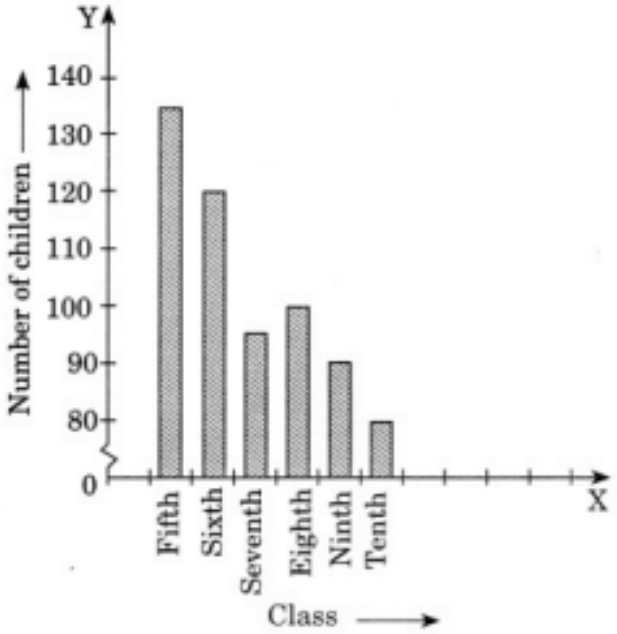
(a) How would you choose a scale?

(b) Answer the following questions:

(i) Which class has the maximum number of children? And the minimum?

(ii) Find the ratio of students of class sixth to the students of class eighth.

Solution:



(a) Scale on y-axis is 1 cm = 10 students

(b)

(i) Fifth class has the maximum number of children i.e., 135.
Tenth class has the minimum number of children i.e., 80.

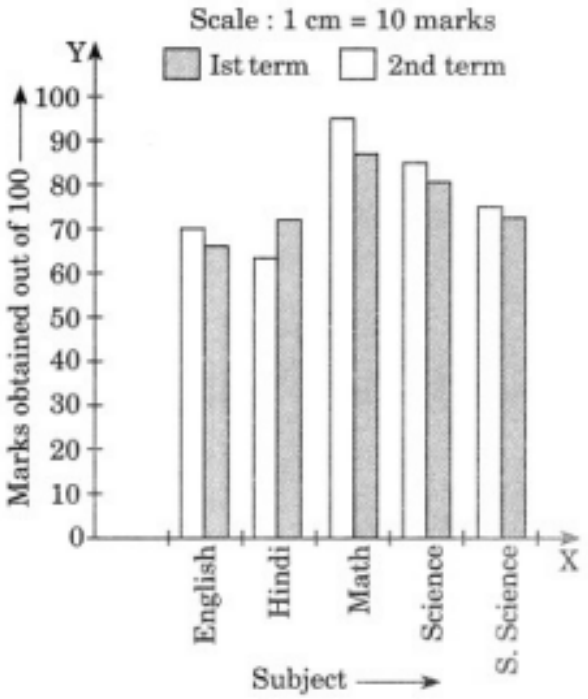
(ii) Number of children in class eight = 100
∴ Ratio of class sixth to the students of class

$$\text{eighth} = \frac{\cancel{120}^{6}}{\cancel{100}_{5}} = \frac{6}{5}, \quad \text{i.e.,} \quad 6:5$$

Q4) The performance of a student in 1st term and 2nd term is given. Draw a double bar graph choosing appropriate scale and answer the following:

Subject	**1st term (M.M. 100)**	**2nd term (M.M. 100)**
English	67	70
Hindi	72	65
Math	88	95
Science	81	85
S. Science	73	75

(i) In which subject, has the child improved his performance the most?
(ii) In which subject is the improvement the least?
(iii) Has the performance gone down in any subject?
Sol)



(i) In Math, the performance of the students improved the most.
(ii) In social science, the performance of the students improved the least.
(iii) Yes, in Hindi the performance of the students has gone down.

Q5) Consider this data collected from survey of a colony.

Favourite sport	Watching	Participating
Cricket	1240	620
Basket ball	470	320
Swimming	510	320
Hockey	430	250
Athletics	250	105

(i) Draw a double bar graph choosing an appropriate scale. What do you infer from the bar graph?

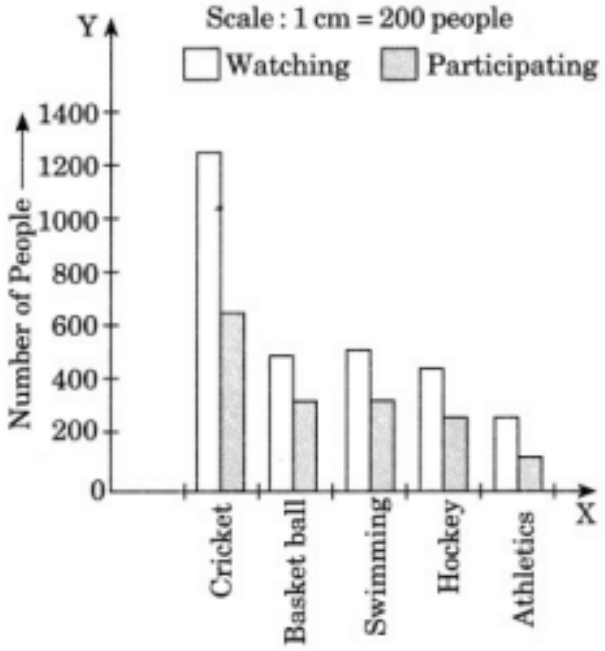
(ii) Which sport is most popular?

(iii) Which is more preferred, watching or participating in sports?

Sol) (i) The above bar graph depicts the number of people who are watching and who are participating in sports.

(ii) Cricket is the most popular sport.

(iii) Watching the sports is more preferred by the people.

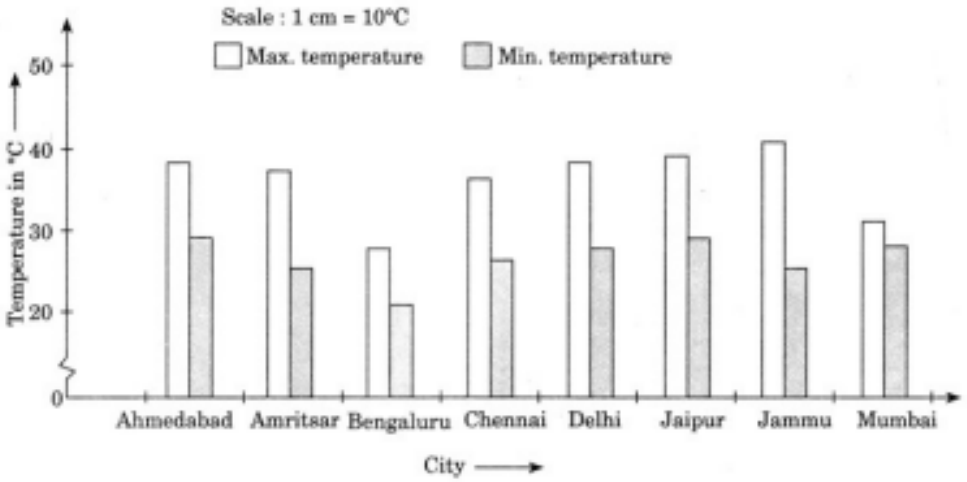


Q6) Take the data giving the minimum and the maximum temperature of various cities given in the beginning of this chapter. Plot a double bar graph using the data and answer the following:

(i) Which city has the largest difference in the minimum and maximum temperature on the given date?
(ii) Which is the hottest city and which is the coldest city?
(iii) Name two cities where maximum temperature of one was less than the minimum temperature of the other.
(iv) Name the city which has the least difference between its minimum and maximum temperature.

Temperature of cities as on 20.6.2006		
City	**Max.**	**Min.**
Ahmedabad	38°C	29°C
Amritsar	37°C	26°C
Bengaluru	28°C	21°C
Chennai	36°C	27°C
Delhi	38°C	28°C
Jaipur	39°C	29°C
Jammu	41°C	26°C
Mumbai	32°C	27°C

Solution:
Double bar graph:



(i) Jammu has the largest difference between the maximum and minimum temperature i.e. 41°C – 26°C = 15°C

(ii) Hottest city is Jammu with 41°C temperature and coldest city is Bangalore with 21°C temperature.

(iii)

- Bangalore having its maximum temperature 28°C is less than the minimum temperature 29°C in Ahmedabad.
- Bangalore having its maximum temperature 28°C is less than the maximum temperature 29°C in Jaipur.

(iv) Mumbai has the least difference between its minimum and maximum temperatures i.e. 32°C – 27°C = 5°C

Exercise 3.4

Q1) Tell whether the following situations are certain to happen, impossible to happen, can happen but not certain.

(i) You are older today than yesterday.

(ii) A tossed coin will land heads up.

(iii) A dice when tossed shall land up with 8 on top.

(iv) The next traffic light seen will be green.

(v) Tomorrow will be a cloudy day.

Sol)

Event	Chance
(i) You are older today than yesterday.	Certain to happen.
(ii) A tossed coin will land heads up.	Can happen but not certain.
(iii) A dice when tossed shall land up 8 on the top.	Impossible.
(iv) The next traffic light seem will be green.	Can happen but not certain.
(v) Tomorrow will be cloudy day.	Can happen but not certain.

Q2) There are 6 marbles in a box with numbers from 1 to 6 marked on each of them.
(i) What is the probability of drawing a marble with number 2?
(ii) What is the probability of drawing a marble with number 5?
Solution:
(i) Total number of marbles marked with the number from 1 to 6 = 6
∴ n(S) = 6
Number of marble marked with 2=1
∴ n(E) = 1
∴ Required probability = n(E) / n(S)=1 / 6

(ii) Number of marble marked with 5 = 1
∴ n(E) = 1
∴ Required probability = n(E) / n(S)=1 / 6

Q3) A coin is flipped to decide which team starts the game. What is the probability that your team will start?
Sol) Coin has 2 faces—Head (H) and Tail (T)
∴ Sample space n (S) = 2
Number of successful event n(E) = 1
∴ Required probability = n(E) / n(S)=1 / 2

Lines And Angles

1. A line segment has two end points.
2. A ray has only one end point (its vertex).
3. A line has no end points on either side.

This chapter throws light on topics such as related angles, pair of lines. The chapter deals with different types of angles and lines. The types of angles discussed in this chapter are as follows:

Pairs of Angles	Condition
Two complementary angles	Measures add up to 90°
Two supplementary angles	Measures add up to 180°
Two adjacent angles	Have a common vertex and a common arm but no common interior
Linear pair	Adjacent and supplementary

1. A linear pair is a pair of adjacent angles whose non-common sides are opposite rays.

Under the topic pair of lines, various sub-sections are discussed namely:

2. Intersecting lines
3. Transversal
4. Angles made by a transversal
5. When two lines intersect (looking like the letter X) we have two pairs of opposite angles. They are called vertically opposite angles. They are equal in measure.
6. A transversal is a line that intersects two or more lines at distinct points.

Six angles discussed in this section:

1. Interior angles
2. Exterior angles
3. Pairs of Corresponding angles
4. Pairs of Alternate interior angles
5. Pairs of Alternate exterior angles
6. Pairs of interior angles on the same side of the transversal
7. Transversal of parallel lines

Subsequently the topic- Checking for Parallel Lines is also discussed in the chapter- Lines and Angles.

1. When a transversal cuts two lines, such that pairs of corresponding angles are equal, then the lines have to be parallel.
2. When a transversal cuts two lines, such that pairs of alternate interior angles are equal, the lines have to be parallel.
3. When a transversal cuts two lines, such that pairs of interior angles on the same side of the transversal are supplementary, the lines have to be parallel.

Exercise 5.1

1. Find the complement of each of the following angles:

(i)

Solution:-
Two angles are said to be complementary if the sum of their measures is 90°.
The given angle is 20°

Let the measure of its complement be x°. Then,

$x + 20° = 90°$, $x = 90° - 20°$, $x = 70°$

Hence, the complement of the given angle measures 70°.

(ii)

Solution:-
Two angles are said to be complementary if the sum of their measures is 90°.
The given angle is 63°

Let the measure of its complement be x°.

Then,

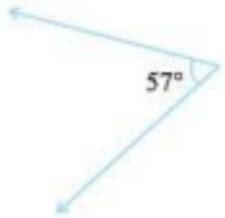
$x + 63° = 90°$

$x = 90° - 63°$

$x = 27°$

Hence, the complement of the given angle measures 27°.

(iii)



Solution:-
Two angles are said to be complementary if the sum of their measures is 90°.
The given angle is 57°

Let the measure of its complement be x°. Then,

$x + 57° = 90°$

$x = 90° - 57°$

$x = 33°$

Hence, the complement of the given angle measures 33°.

2. Find the supplement of each of the following angles:
(i)

Solution:-
Two angles are said to be supplementary if the sum of their measures is 180°.
The given angle is 105°

Let the measure of its supplement be x°.

Then,
$x + 105° = 180°$

$x = 180° - 105°$

$x = 75°$

Hence, the supplement of the given angle measures 75°.

(ii)

Solution:-
Two angles are said to be supplementary if the sum of their measures is 180°.
The given angle is 87°

Let the measure of its supplement be x°. Then,

$x + 87° = 180°$

$x = 180° – 87°$

$x = 93°$

Hence, the supplement of the given angle measures 93°.

(iii)

Solution:-
Two angles are said to be supplementary if the sum of their measures is 180°.
The given angle is 154°

Let the measure of its supplement be x°.

Then,
$x + 154° = 180°$

$x = 180° – 154°$

$x = 26°$

Hence, the supplement of the given angle measures 93°.

3. Identify which of the following pairs of angles are complementary and which are supplementary.
(i) 65°, 115°

Solution:-
We have to find the sum of given angles to identify whether the angles are complementary or supplementary.
Then,
$65° + 115°$

$180°$

If the sum of two angle measures is 180°, then the two angles are said to be supplementary.
∴ These angles are supplementary angles.

(ii) 63°, 27°

Solution:-
We have to find the sum of given angles to identify whether the angles are complementary or supplementary.
Then,
$63° + 27° = 90°$

If the sum of two angle measures is 90°, then the two angles are said to be complementary.
∴ These angles are complementary angles.
(iii) 112°, 68°

Solution:-
We have to find the sum of given angles to identify whether the angles are complementary or supplementary.

Then,
$112^\circ + 68^\circ = 180^\circ$

If the sum of two angle measures is 180°, then the two angles are said to be supplementary.
∴ These angles are supplementary angles.

(iv) 130°, 50°

Solution:-
We have to find the sum of given angles to identify whether the angles are complementary or supplementary.
Then,
$130^\circ + 50^\circ = 180^\circ$
If the sum of two angle measures is 180°, then the two angles are said to be supplementary.
∴ These angles are supplementary angles.

(v) 45°, 45° and (vi) 80°, 10° **(Do it yourself)**

4. Find the angle which are equal to their complement.

Solution:-
Let the measure of the required angle be x°.
We know that the sum of measures of complementary angle pair is 90°.

Then, $x + x = 90^\circ$

$2x = 90^\circ$

$x = 90^\circ / 2$

$x = 45^\circ$

Hence, the required angle measure is 45°.

5. Find the angles which are equal to their supplement.

Solution:-
Let the measure of the required angle be x°.
We know that the sum of measures of supplementary angle pair is 180°.

Then, $x + x = 180^\circ$

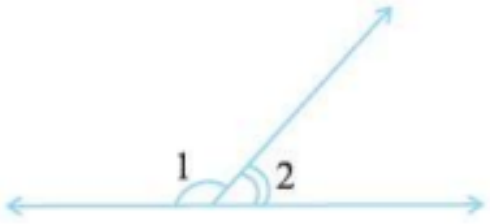
$2x = 180^\circ$

$x = 180^\circ / 2$

$x = 90^\circ$

Hence, the required angle measure is 90°.

6. In the given figure, ∠1 and ∠2 are supplementary angles. If ∠1 is decreased, what changes should take place in ∠2 so that both angles still remain supplementary?



Solution:-
From the question, it is given that
$\angle 1$ and $\angle 2$ are supplementary angles.
If $\angle 1$ is decreased, then $\angle 2$ must be increased by the same value. Hence, this angle pair remains supplementary.

7. Can two angles be supplementary if both of them are:

(i). Acute?

Solution:-
No. If two angles are acute, which means less than 90°, then they cannot be supplementary because their sum will always be less than 90°.

(ii). Obtuse?

Solution:-

No. If two angles are obtuse, which means more than 90°, then they cannot be supplementary because their sum will always be more than 180°.

(iii). Right?

Solution:-

Yes. If two angles are right, which means both measure 90°, then they can form a supplementary pair.
$\therefore 90^\circ + 90^\circ = 180$

8. An angle is greater than 45°. Is its complementary angle greater than 45° or equal to 45° or less than 45°?

Solution:-

Let us assume the complementary angles be p and q,
We know that the sum of measures of complementary angle pair is 90°.
Then, $p + q = 90^\circ$
It is given in the question that $p > 45^\circ$

Adding q on both sides, $p + q > 45^\circ + q$

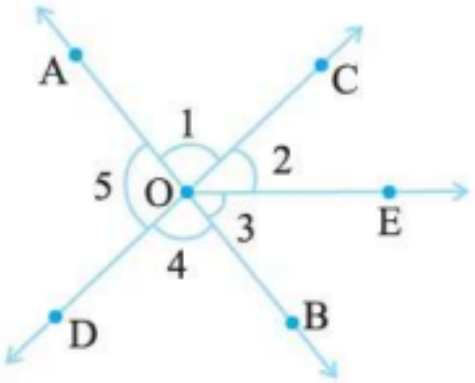
$90^\circ > 45^\circ + q$

$90^\circ - 45^\circ > q$

$q < 45^\circ$

Hence, its complementary angle is less than 45°.

9. In the adjoining figure:



(i) Is ∠1 adjacent to ∠2?

Solution:-
Yes, because ∠1 and ∠2 have a common vertex, i.e., O and a common arm, OC.
Their non-common arms, OA and OE, are on both sides of the common arm.

(ii) Is ∠AOC adjacent to ∠AOE?

Sol)
No, since they have a common vertex O and common arm OA. But, they have no non-common arms on both sides of the common arm.

(iii) Do ∠COE and ∠EOD form a linear pair?

Sol)
Yes, as ∠COE and ∠EOD have a common vertex, i.e. O and a common arm OE.
Their non-common arms, OC and OD, are on both sides of the common arm.

(iv) Are ∠BOD and ∠DOA supplementary?

Sol)
Yes, as ∠BOD and ∠DOA have a common vertex, i.e. O and a common arm OE.
Their non-common arms, OA and OB, are opposite to each other.

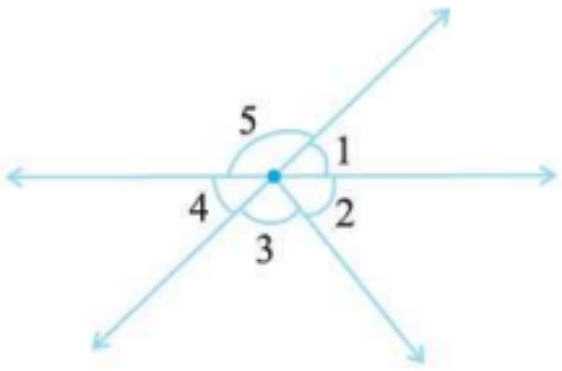
(v) Is ∠1 vertically opposite to ∠4?

Sol) Yes, ∠1 and ∠2 are formed by the intersection of two straight lines AB and CD.

(vi) What is the vertically opposite angle of ∠5?

Sol) ∠COB is the vertically opposite angle of ∠5 as these two angles are formed by the intersection of two straight lines AB and CD.

10. Indicate which pairs of angles are:



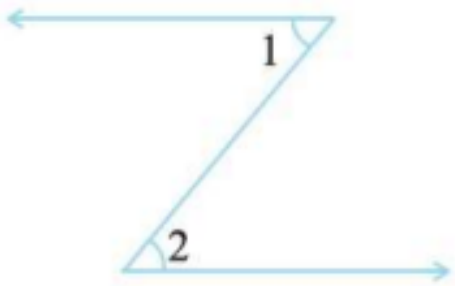
(i) Vertically opposite angles.

Sol) By observing the figure, we can say that
$\angle 1$ and $\angle 4$, $\angle 5$ and $\angle 2 + \angle 3$ are vertically opposite angles. Because these two angles are formed by the intersection of two straight lines.

(ii) Linear pairs.

Sol) By observing the figure, we can say that,
$\angle 1$ and $\angle 5$, $\angle 5$ and $\angle 4$ are linear pairs as these have a common vertex and and their sum is 180^0

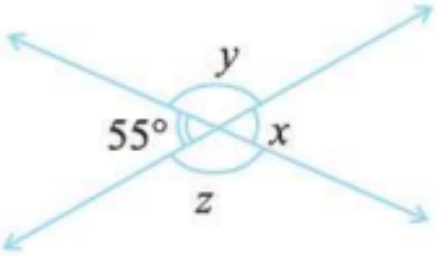
11. In the following figure, is $\angle 1$ adjacent to $\angle 2$? Give reasons.



Sol) $\angle 1$ and $\angle 2$ are not adjacent angles because they are not lying on the same vertex.

12. Find the values of the angles x, y, and z in each of the following:

(i)



Solution:-
$\angle x = 55^o$, because vertically opposite angles.

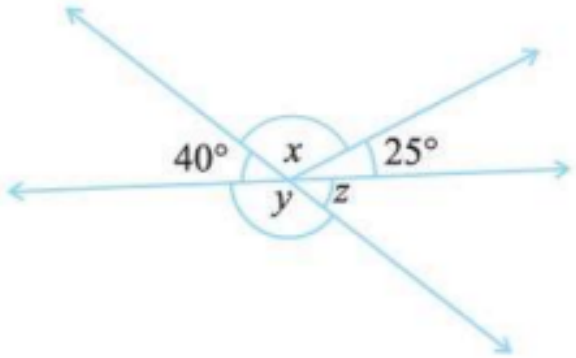
$\angle x + \angle y = 180^o$ … [∵ linear pair]
$55^o + \angle y = 180^o$

$\angle y = 180^o - 55^o$

$\angle y = 125^o$

Then, $\angle y = \angle z$ … [∵ vertically opposite angles]
$\therefore \angle z = 125^o$

(ii)



Solution:-

$\angle z = 40^\circ$, because vertically opposite angles.

$\angle y + \angle z = 180^\circ$ … [∵ linear pair]
$\angle y + 40^\circ = 180^\circ$

$\angle y = 180^\circ - 40^\circ$

$\angle y = 140^\circ$

Then, $40 + \angle x + 25 = 180^\circ$ … [∵angles on straight line]
$65 + \angle x = 180^\circ$

$\angle x = 180^\circ - 65$
$\therefore \angle x = 115^\circ$

13. Fill in the blanks.

(i) If two angles are complementary, then the sum of their measures is _____.

Sol) If two angles are complementary, then the sum of their measures is 90°.

(ii) If two angles are supplementary, then the sum of their measures is _____.

Sol) If two angles are supplementary, then the sum of their measures is 180°.

(iii) Two angles forming a linear pair are _____.

Sol) Two angles forming a linear pair are supplementary.

(iv) If two adjacent angles are supplementary, they form a _____.

Sol) If two adjacent angles are supplementary, they form a linear pair.

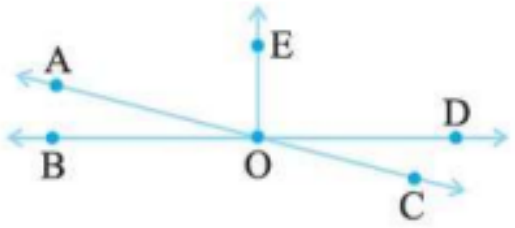
(v) If two lines intersect at a point, then the vertically opposite angles are always _____

Sol) If two lines intersect at a point, then the vertically opposite angles are always equal.

(vi) If two lines intersect at a point, and if one pair of vertically opposite angles are acute angles, then the other pair of vertically opposite angles are _____.

Sol) If two lines intersect at a point, and if one pair of vertically opposite angles are acute angles, then the other pair of vertically opposite angles are obtuse angles.

14. In the adjoining figure, name the following pairs of angles.



(i) Obtuse vertically opposite angles

Sol) ∠AOD and ∠BOC are obtuse vertically opposite angles in the given figure.

(ii) Adjacent complementary angles

Sol) ∠EOA and ∠AOB are adjacent complementary angles in the given figure.

(iii) Equal supplementary angles

Sol) ∠EOB and EOD are the equal supplementary angles in the given figure.

(iv) Unequal supplementary angles

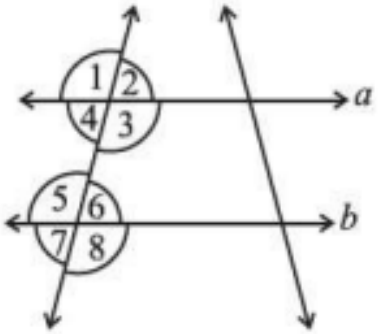
Sol) ∠EOA and ∠EOC are the unequal supplementary angles in the given figure.

(v) Adjacent angles that do not form a linear pair

Sol) ∠AOB and ∠AOE, ∠AOE and ∠EOD, ∠EOD and ∠COD are the adjacent angles that do not form a linear pair in the given figure.

Exercise 5.2

1. State the property that is used in each of the following statements?



(i) If a ∥ b, then ∠1 = ∠5.

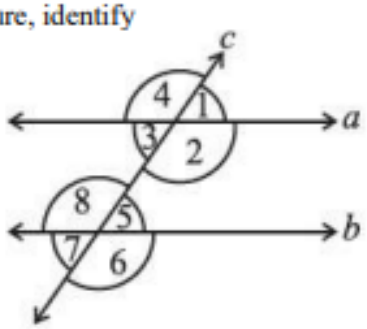
Solution:-
Corresponding angles property is used in the above statement.

(ii) If ∠4 = ∠6, then a ∥ b.

Solution:-
Alternate interior angles property is used in the above statement.

(iii) If ∠4 + ∠5 = 180°, then a ∥ b.

Solution:-
Interior angles on the same side of the transversal are supplementary.
2. In the adjoining figure, identify

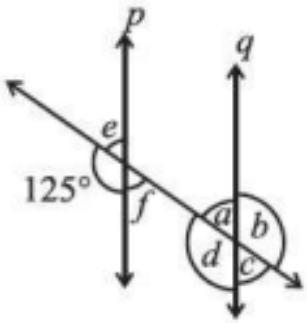


(i) The pairs of corresponding angles.
Solution:-
By observing the figure, the pairs of the corresponding angles are,
∠1 and ∠5, ∠4 and ∠8, ∠2 and ∠6, ∠3 and ∠7 (ii) The

pairs of alternate interior angles.

Solution:-
By observing the figure, the pairs of alternate interior angles are,
∠2 and ∠8, ∠3 and ∠5
(iii) The pairs of interior angles on the same side of the transversal.
Solution:-
By observing the figure, the pairs of interior angles on the same side of the transversal are ∠2 and ∠5, ∠3 and ∠8 (iv) The vertically opposite angles.
Solution:-
By observing the figure, the vertically opposite angles are,
∠1 and ∠3, ∠5 and ∠7, ∠2 and ∠4, ∠6 and ∠8

3. In the adjoining figure, p ∥ q. Find the unknown angles.



Solution:-

By observing the figure,
∠d = ∠125° … [∵ corresponding angles]
We know that Linear pair is the sum of adjacent angles is 180°

Then,

$\angle e + 125^\circ = 180^\circ$ … [Linear pair]

$\angle e = 180^\circ - 125^\circ$

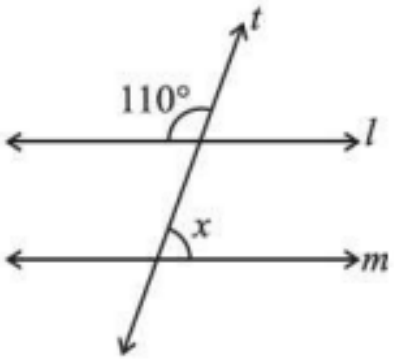
$\angle e = 55^\circ$

From the rule of vertically opposite angles,
$\angle f = \angle e = 55^\circ$

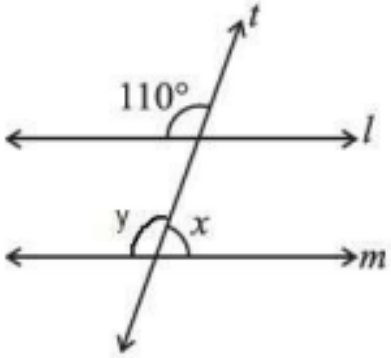
$\angle b = \angle d = 125^\circ$
By the property of corresponding angles,
$\angle c = \angle f = 55^\circ$

$\angle a = \angle e = 55^\circ$

4. Find the value of x in each of the following figures if l ∥ m.
(i)



Solution:-
Let us assume the other angle on the line m be $\angle y$.



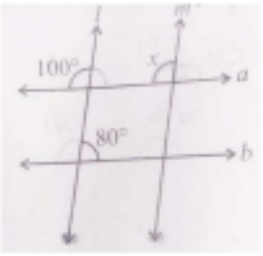
Then,
By the property of corresponding angles,
$\angle y = 110^\circ$
We know that Linear pair is the sum of adjacent angles is 180°

Then,
$\angle x + \angle y = 180^\circ$
$\angle x + 110^\circ = 180^\circ$

$\angle x = 180^\circ - 110^\circ$

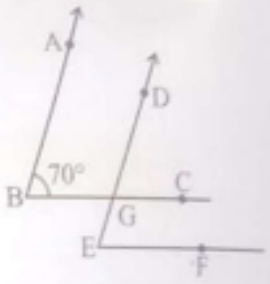
$\angle x = 70^\circ$

(ii)



Solution :- Try it yourself

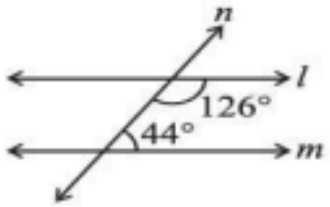
5. In the given figure, the arms of two angles are parallel.
If ∠ABC = 70°, then find
(i) ∠DGC
(ii) ∠DEF



Solution :Do it yourself

6. In the given figures below, decide whether *l* is parallel to m.

(i)



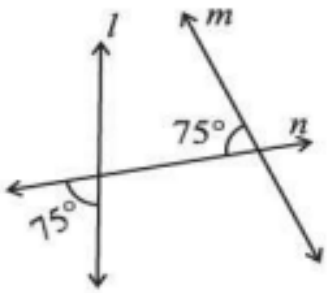
Solution:-
Let us consider the two lines, *l* and m.
n is the transversal line intersecting *l* and m.
We know that the sum of interior angles on the same side of the transversal is 180°.

Then, 126° + 44° = 170°

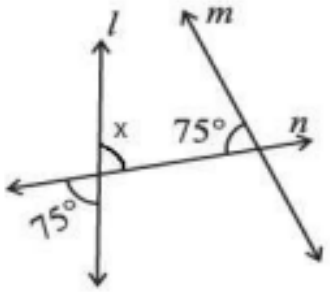
But, the sum of interior angles on the same side of transversal is not equal to 180°.

So, line *l* is not parallel to line m.

(ii)



Solution:-
Let us assume ∠x be the vertically opposite angle formed due to the intersection of the straight line *l* and transversal n,
Then, ∠x = 75°



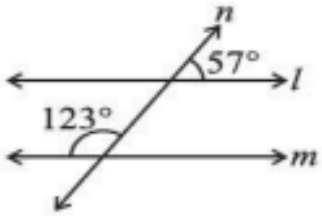
Let us consider the two lines, *l* and m.
n is the transversal line intersecting *l* and m.
We know that the sum of interior angles on the same side of the transversal is 180°.

Then, 75° + 75° = 150°

But, the sum of interior angles on the same side of transversal is not equal to 180°.

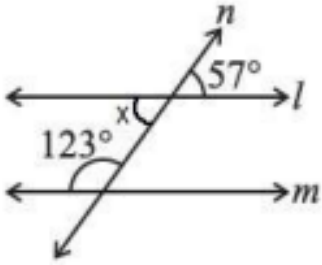
So, line *l* is not parallel to line m.

(iii)



Solution:-

Let us assume ∠x be the vertically opposite angle formed due to the intersection of the straight line *l* and transversal line n.



Let us consider the two lines, *l* and m.
n is the transversal line intersecting *l* and m.
We know that the sum of interior angles on the same side of the transversal is 180°.
Then,
123° + ∠x = 123° + 57°
= 180°

∴ The sum of interior angles on the same side of the transversal is equal to 180°.
So, line *l* is parallel to line m.

(iv)

Solution : Do it yourself