Class VIII Session 2024-25
Subject - Mathematics
Sample Question Paper - 4

Time Allowed: 3 hours **Maximum Marks: 80**

General Instructions:

1. This Question Paper has 4 Sections A-D.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 6 questions carrying 02 marks each.
4. Section C has 8 questions carrying 03 marks each.
5. Section D has 6 questions carrying 04 marks each.
6. All Questions are compulsory.
7. Draw neat figures wherever required. Take π =22/7 wherever required if not stated

Section A

1. The number which is neither positive nor negative is **[1]**

   a) 0 b) 5

   c) 1 d) 10

2. If x + 0 = 0 + x = x, which is rational number, then 0 is called **[1]**

   a) multiplicative inverse of x b) additive inverse of x

   c) reciprocal of x d) identity for addition of rational numbers

3. Solve: $\frac{x-4}{3} + \frac{2x-3}{35} = \frac{5x-32}{9} - \frac{x+9}{28}$ **[1]**

   a) 19 b) 5

   c) 10 d) 20

4. Solve: $2y + \frac{5}{3} = \frac{26}{3} - y$ **[1]**

   a) $\frac{7}{3}$ b) 7

   c) 3 d) $\frac{5}{3}$

5. What is the sum of the measures of the angles of a convex quadrilateral? **[1]**

   a) 90^o b) 45^o

   c) 180° d) 360^o

6. The three angles of any quadrilateral is 105°, 120° and 75° respectively, the fourth angle is **[1]**

   a) 75^o b) 50^o

   c) 60^o d) 70^o

7. Which of the following would end with digit 1? **[1]**

A. 49^2

B. 23^2

C. 54^2

D. 67^2

a) D b) A

c) C d) B

8. What is the value of $\sqrt{1522756}$? **[1]**

a) 2434 b) 1234

c) 1232 d) 1324

9. If one side of a cube is 33 m, then the volume of the cube is **[1]**

a) 35936 b) 3934

c) 39753 d) 35937

10. Find the smallest number by which 8788 must be divided so that the quotient will be a perfect cube. **[1]**

a) 4 b) 5

c) 3 d) 6

11. A table marked at Rs 15,000 is available for Rs 14,400. Find the discount percent. **[1]**

a) 3% b) 5%

c) 6% d) 4%

12. The compound interest on ₹ 30000 at 7% per annum is ₹ 4347. The period (in years) is: **[1]**

a) 3 b) 2

c) $2\frac{1}{2}$ d) 4

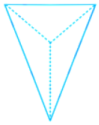
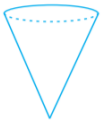
13. Add: a - b + ab, b - c + bc, c - a + ac **[1]**

a) ab + bc + ac b) ab + bc

c) a + b + c d) abc

14. Which of the following 3-dimensional figures has the top, side and front as triangles? **[1]**

a)  b) 

c)  d) 

15. A metallic cylindrical pipe has outer radius of 3 cm and an inner radius of 2 cm. If the length of the pipe is 70 cm, then the volume of metal in the pipe, in cm^3, is **[1]**

a) 280π b) 630π

c) 910π d) 350π

16. If $3^x = \frac{1}{9}$, the value of x is **[1]**

a) 1 b) -2

c) 2 d) $\frac{1}{2}$

17. $\left(\frac{x^{-3}}{y^3}\right)^{2/3} \times \left(\frac{x^3}{y^{-3}}\right)^{-2/3}$ is equal to **[1]**

a) $\frac{1}{x^2y^2}$ b) $\frac{y^4}{x^{-4}}$

c) $\frac{x^4}{y^{-4}}$ d) $\frac{x^{-4}}{y^4}$

18. x and y are in inverse proportion. When x = 12, y = 3. Which of the following is not a possible pair of corresponding values of x and y? **[1]**

a) 5 and 6 b) 10 and 3.6

c) 4 and 9 d) 72 and 0.5

19. The factorisation of $x^2 + x + xy + y + zx + z$ is. **[1]**

a) (x + y + z)(z + x) b) (x + y + z)(x + y)

c) (x + y + z)(y + z) d) (x + y + z)(x + 1)

20. Factorise: $169a^2 - 144b^2$ **[1]**

a) (13a + 12b) b) (13a - 12b)

c) (12a - 13b) d) (13a + 12b) (13a - 12b)

Section B

21. Solve: $x + 7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$ **[2]**

OR

Solve: 0.16 (5x - 2) = 0.4x + 7

22. How many sides does a regular polygon have if the measure of an exterior angle is 24°? **[2]**

23. Shoes of the following brands are sold in November 2007 at a shoe store. Construct a pie chart for the given data. **[2]**

Brand	Number of pairs of shoes sold
A	130
B	120
C	90
D	40
E	20

24. Is 68600 a perfect cube? If not, find the smallest number by which 68600 must be multiplied to get a perfect cube? **[2]**

OR

Find out if 6859 is a perfect cube?

25. Simplify 3x (4x – 5) + 3 and find its values for **[2]**

i. x = 3

ii. x = $\frac{1}{2}$

26. The distance between school and house of a girl is given by 5 cm in a picture, using the scale 1cm: 5 km. Find the actual distance between the two places? **[2]**

27. Find $\frac{-4}{5} \times \frac{3}{7} \times \frac{15}{16} \times \left(\frac{-14}{9}\right)$ **[3]**

OR

Four friends had a competition to see how far could they hop on one foot. The table given shows the distance covered by each.

Name	Distance covered (in km)
Seema	$\frac{1}{25}$
Nancy	$\frac{1}{32}$
Megha	$\frac{1}{40}$
Soni	$\frac{1}{20}$

a. How farther did Soni hop than Nancy?

b. What is the total distance covered by Seema and Megha?

c. Who walked farther, Nancy or Megha?

28. Solve the linear equation $\frac{x-5}{3} = \frac{x-3}{5}$. **[3]**

29. Find the smallest number by which 1620 must be divided to get a perfect square. **[3]**

30. The cost of 5 oranges is ₹ 75 and the cost of 6 apples is ₹ 78. Which fruit is costlier and why? **[3]**

OR

The cost price of an article is ₹375. Find the marked price of the article so as to gain 8%, after allowing a discount of 25%?

31. Find the sum of $4x^2 - 3x + 2$ and $3x^2 + 4x - 8$. **[3]**

32. Daniel is painting the walls and ceiling of a cuboidal hall with length, breadth and height of 15 m, 10 m and 7 m respectively. From each can of paint 100 m^2 of area is painted. How many cans of paint will she need to paint the room? **[3]**

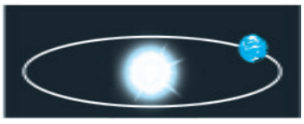
33. A light-year is a distance that light can travel in one year. **[3]**

1 light year = 9,460,000,000,000 km.

a. Express one light-year in scientific notation.

b. The average distance between Earth and Sun is 1.496×10^8 km.

Is the distance between Earth and the Sun greater than, less than or equal to one light-year?



34. Factorise: $a^4 - 2a^2b^2 + b^4$ **[3]**

35. ABCD is a trapezium such that AB ∥ CD, ∠A: ∠D = 2: 1, ∠B = ∠C = 7: 5. Find the angles of the trapezium. **[4]**

OR

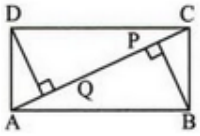
In the given rectangle ABCD, BP and DQ are perpendiculars to AC from B and D respectively/ Answer the following and give reasons for your answers.

i. Is AD = BC?

ii. Is ∠BAP = ∠DCQ ?

iii. Is $\Delta DAQ \cong \Delta BCP$?

iv. Is BP = DQ?



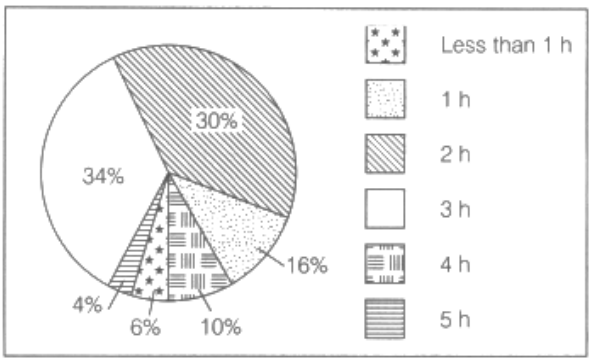
36. Given below is a pie chart showing the time spend by a group of 350 children in different games. Observe it and answer the questions that follow. **[4]**

a. How many children spend atleast one hour in playing games?

b. How many children spend more than 2 h in playing games?

c. How many children spend 3 or lesser hours in playing games?

d. Which is greater, number of children who spend 2 hours or more per day or number of children who play for less than one hour?



37. Arunima bought household items whose marked price and discount % is as follows **[4]**

Item	**Quantity**	**Rate** (in ₹)	**Discount%**
(i) Atta	1 packet	200	16%
(ii) Detergent	1 packet	371	22.10%
(ii) Namkeen	1 packet	153	18.30%

Find the total amount of the bill she has to pay.

OR

A sum of money becomes ₹ 17,640 in 2 years and ₹ 18,522 in 3 years at the same rate of interest compounded annually. Find the rate of interest.

38. The length , width and height of a cuboid are 10cm, 8 cm and 7 cm respectively . Find the lateral surface area of a cuboid? **[4]**

39. Suppose 2 kg of sugar contains 9×10^6 crystals. How many sugar crystals are there in **[4]**

(i) 5 kg of sugar ?

(ii) 1.2 kg of sugar ?

40. Ajit can ride a scooter constantly at a speed of 30 kms/hour. Draw a time-distance graph for this situation. Use it to find **[4]**

i. the time taken by Ajit to ride 75 km.

ii. the distance covered by Ajit in $3\frac{1}{2}$ hours.

Solution

Section A

1. **(a)** 0

   Explanation: 0 is neither positive nor negative.

2. **(d)** identity for addition of rational numbers

   Explanation: We know that, the sum of any rational number and zero (0) is the rational number itself. Now, x + 0 = 0 + x = x, which is a rational number, then 0 is called identity for addition of rational numbers.

3. **(a)** 19

   Explanation: $\frac{x-4}{3} + \frac{2x-3}{35} = \frac{5x-32}{9} - \frac{x+9}{28}$

   Multiplying throughout by 9, we have

   3x -12 + $\frac{18x-27}{35}$ = 5x - 32 - $\frac{9x+81}{28}$ transposing,

   $\frac{18x-27}{35} + \frac{9x+81}{28}$ = 2x - 20

   Now clear of fractions by multiplying by

   $5 \times 7 \times 4$ or 14

   thus 72x - 108 + 45x + 405 = 280x -2800

   $\therefore$ 2800 - 108 + 405 = 280x - 72x - 45x

   $\therefore$ 3097 = 163

   $\therefore$ x = 19

4. **(a)** $\frac{7}{3}$

   Explanation: $2y + \frac{5}{3} = \frac{26}{3} - y$

   or, 2y + y = $\frac{26}{3}$ - $\frac{5}{3}$

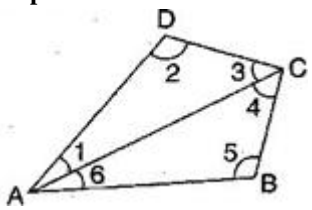
   or, 3y = $\frac{21}{3}$

   or, 3y = 7

   or, y = $\frac{7}{3}$

5. **(d)** 360^o

   Explanation:

   Let ABCD is a convex quadrilateral, then we draw a diagonal AC which divides the quadrilateral into two triangles.

   $\angle A + \angle B + \angle C + \angle D$

   $= \angle 1 + \angle 6 + \angle 5 + \angle 4 + \angle 3 + \angle 2$

   $= \angle(1 + 2 + 3) + \angle(4 + 5 + 6)$

   We are aware that the total sum of the interior angles of any triangle will be 180^o and a quadrilateral is made up of two triangles

   Thus, the sum of the interior angles of both the triangles are $180 + 180 = 360^\circ$

   So,the sum of the measures of the angles of a convex quadrilateral is 360^o

6. **(c)** 60^o

   Explanation: Let the sum of all four angles of rhombus = 360°

   A/q

The three angles of quadrilateral is 105°, 120°, 75°
The measurement of fourth angle = 360° - (105° + 120° + 75°)
= 360° - 300° = 60°

7.

(b) A

Explanation: The answer is 49^2 as here the unit's digit is 9 and $9^2 = 81$ where the unit's digit is 1, so 49^2 would end with digit 1.

8.

(b) 1234

Explanation: From the prime factorization of $\sqrt{1522756}$ we get 1234.

9.

(d) 35937

Explanation: Volume of cube = $(33)^3$ = 35937

10. **(a)** 4

Explanation: 8788 = $2 \times 2 \times 13 \times 13 \times 13$
Therefore, by above calculation we get that if 8788 is divided by 4 then it gives a perfect cube.

11.

(d) 4%

Explanation: Discount = $\frac{Marked price - Selling price}{Marked price} \times 100$
$= \frac{15,000 - 14,400}{15,000} \times 100$
$= \frac{600 \times 100}{15,000}$
= 4%

12.

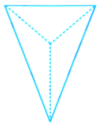
(b) 2

Explanation: P = ₹ 30000, r = 7% P.a., C.I = ₹ 4347,
n = ?
$\Rightarrow$ Amount = ₹ 30000 + ₹ 4347 = ₹ 34347
$\therefore 34347 = 30000\left(1 + \frac{7}{100}\right)^n$
$\Rightarrow \left(\frac{107}{100}\right)^n = \frac{34347}{30000} = \frac{11449}{10000}$
$\Rightarrow \left(\frac{107}{100}\right)^n = \left(\frac{107}{100}\right)^2 \Rightarrow$ n = 2

13. **(a)** ab + bc + ac

Explanation: (a - b + ab) + (b - c + bc) + (c - a + ac)
opening brackets we get,
a - b + ab + b - c + bc + c - a + ac
solving like terms and unlike terms we get,
a - a - b + b - c + c + ab + bc + ac
0 + 0 + 0 + ab + bc + ac
ab + bc + ac

14.

(c) 

Explanation: 3-dimensional figures has the top, side and front as triangles name as a triangular pyramid.

15.

(d) 350π

Explanation: According to the question,
Outer radius (r_1) of pipe = 3 cm
inner radius (r_2) of pipe = 2 cm

length of pipe (h) = 70 cm

∴ Volume of metal in the pipe = $\pi(r_1^2 - r_2^2) \times h$

= $\pi(3^2 - 2^2) \times 70$

= $\pi(9 - 4) \times 70$

= $\pi \times 5 \times 70 = 350\pi$ cm^3

16.

(b) -2

Explanation: ∵ $3^x = \frac{1}{9}$

∴ $3^x = \left(\frac{1}{3}\right)^2$

or $3^x = 3^{-2}$

On comparing both sides, we get x = -2

17.

(d) $\frac{x^{-4}}{y^4}$

Explanation: $\frac{x^{-4}}{y^4}$

18. **(a)** 5 and 6

Explanation: For inverse proportion, xy = constant or $x_1y_1 = x_2y_2$

As, $x_1y_1 = 36$; $x_2y_2 = 5 \times 6 = 30$

∴ $x_1y_1 \neq x_2y_2$

19.

(d) (x + y + z)(x + 1)

Explanation: $x^2 + x + xy + y + zx + z$

= x(x + 1) + y (x + 1) + z (x + 1)

= (x + 1)(x + y + z)

20.

(d) (13a + 12b) (13a - 12b)

Explanation: $169a^2 - 144b^2$

$(13a)^2 - (12b)^2$

(13a + 12b) (13a - 12b)

Section B

21. $x + 7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$

$\Rightarrow \frac{x}{1} - \frac{8x}{3} + \frac{5x}{2} = \frac{17}{6} - \frac{7}{1}$

$\Rightarrow \frac{6x - 16x + 15x}{6} = \frac{17 - 42}{6}$

$\Rightarrow \frac{5x}{6} = \frac{-25}{6}$

$\Rightarrow x = \frac{-25 \times 6}{6 \times 5}$

$\Rightarrow$ x = -5

OR

Given, 0.16 (5x - 2) = 0.4x + 7

$\Rightarrow$ 0.8x - 0.32 = 0.4x + 7

$\Rightarrow$ 0.8x - 0.4x = 0.32 + 7 [transposing 0.4x to LHS and - 0.32 to RHS]

$\Rightarrow$ 0.4x = 7.32

$\Rightarrow \frac{0.4x}{0.4} = \frac{7.32}{0.4}$ [dividing both sides by 0.4]

∴ x = 18.3

22. Let the number of sides be n, Then, n(24°) = 360°.

$\Rightarrow n = \frac{360^\circ}{24^\circ} = 15$

Hence, the number of sides is 15.

23. Total number of pairs of shoes sold = (130 + 120 + 90 + 40 + 20) = 400

∴ Central angle of pie chart representing the brands:

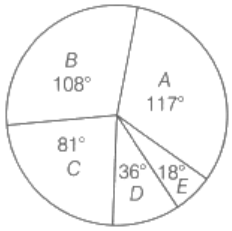
i. $A = \frac{130}{400} \times 360^\circ = 117^\circ$ (as total central angle =360^o)

ii. $B = \frac{120}{400} \times 360^\circ = 108^\circ$

iii. $C = \frac{90}{40} \times 360^\circ = 81^\circ$

iv. $D = \frac{40}{400} \times 360^\circ = 36^\circ$

v. $E = \frac{20}{400} \times 360^\circ = 18^\circ$



24. We have, 68600 = $2 \times 2 \times 2 \times 5 \times 5 \times 7 \times 7 \times 7$. In this factorisation, we find that there is no triplet of 5.

So, 68600 is not a perfect cube. To make it a perfect cube we multiply it by 5.

Thus, $68600 \times 5 = 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 7 \times 7 \times 7$ = 343000, which is a perfect cube.

Hence, the smallest number by which 68600 must be multiplied to get a perfect cube is 5.

OR

19	6859
19	361
19	19
	1

By prime factorisation,

6859 = $\underline{19} \times \underline{19} \times \underline{19}$ [grouping the factors in triplets]

= 19^3 which is a perfect cube.

Therefore, 6859 is a perfect cube.

25. We have 3x (4x - 5) + 3

simplification: 3x (4x - 5) + 3 = 3x (4x) - 3x(5) + 3 = $12x^2$ - 15x + 3

i. x = 3

Putting x = 3 in above equation, we get 12 $(3)^2$ - 15(3) + 3

= 12 (9) - 45 + 3

= 108 - 42 = 66

ii. x = $\frac{1}{2}$

Putting x = $\frac{1}{2}$ in above equation, we get

$12\left(\frac{1}{2}\right)^2 - 15\left(\frac{1}{2}\right) + 3$

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

= 3 - $\frac{15}{2}$ + 3

= 6 - $\frac{15}{2}$

$= \frac{12-15}{2}$

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

26. Given scale = 1 cm : 5 km, i.e. 1 cm in picture = 5 km of actual distance

$\therefore$ 5 cm in picture = 5 $\times$ 5 km

Hence, the actual distance between the two places is 25 km.

27. We have, $\frac{-4}{5} \times \frac{3}{7} \times \frac{15}{16} \times \left(\frac{-14}{9}\right)$

$= \left(\frac{-4}{5} \times \frac{15}{16}\right) \times \left[\frac{3}{7} \times \left(\frac{-14}{9}\right)\right]$ [$\because$using commutativity and associativity]

$= \frac{-3}{4} \times \left(\frac{-2}{3}\right)$

$= \frac{1}{2}$

OR

We have, $\frac{1}{25}, \frac{1}{32}, \frac{1}{40}, \frac{1}{20}$

At first, we convert the numbers as like denominators.

2	25, 32, 40, 20
2	25, 16, 20, 10
2	25, 8, 10, 5
5	25, 4, 5 5
	5, 4, 1 1

Taking LCM of 25, 32, 40 and 20 = $2 \times 2 \times 2 \times 5 \times 5 \times 4 = 800$

we get,

$\frac{1}{25} = \frac{1\times32}{25\times32} = \frac{32}{800}, \frac{1}{32} = \frac{1\times25}{32\times25} = \frac{25}{800}; \frac{1}{40} = \frac{1\times20}{40\times20} = \frac{20}{800}$ and $\frac{1}{20} = \frac{1\times40}{20\times40} = \frac{40}{800}$

a. Soni hop more than Nancy $= \frac{40}{800} - \frac{25}{800} = \frac{40-25}{800} = \frac{15}{800} = \frac{3}{160}$

b. Total distance covered by Seema and Megha $= \frac{32}{800} + \frac{20}{800} = \frac{32+20}{800} = \frac{52}{800} = \frac{13}{200}$

c. It is clear that Nancy walked farther than Megha.

28. $\frac{x-5}{3} = \frac{x-3}{5}$

It is a linear equation since it involves linear expressions only.

$\therefore \frac{x}{3} - \frac{5}{3} = \frac{x}{5} - \frac{3}{5}$

$\therefore \frac{x}{3} - \frac{x}{5} = -\frac{3}{5} + \frac{5}{3}$ ... [Transposing $\frac{x}{5}$ to L.H.S. and $\frac{-5}{3}$ to R.H.S.]

$\therefore \frac{5x-3x}{15} = \frac{25-9}{15}$

$\therefore \frac{2x}{15} = \frac{16}{15}$

$\therefore$ x = 8

this is the required solution.

Verification,

L.H.S. = $\frac{8-5}{3} = \frac{3}{3}$ = 1

R.H.S. = $\frac{8-3}{5} = \frac{5}{5}$ = 1

Therefore, L.H.S. = R.H.S.

29. The prime factorisation of 1620 is $1620 = 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 5$

We see that prime factor 5 has no pair. So, if we divide 1620 by 5, then we get

2	1620
2	810
3	405
3	135
3	45
3	15
	5

$1620 \div 5 = 2 \times 2 \times 3 \times 3 \times 3 \times 3$

Now each factor has a pair. Therefore, $\frac{1620}{5}$ = 324 is a perfect square.

Thus the required smallest number is 5.

30. Cost of 5 oranges = ₹ 75

Cost of 1 orange $= \frac{75}{5} = ₹15$

Cost of 6 apples = ₹ 78

Cost of 1 apples $= \frac{78}{6} = ₹13$

As, 15>13,

oranges are more costlier than apples.

OR

C.P. of the article = ₹ 375

Gain = 8%

$S.P. = \frac{100+Gain\%}{100} \times C.P.$

$= \frac{100+8}{100} \times 375$

$= \frac{108}{100} \times 375 = ₹405$

Let the marked price of the article be Rs. x

Discount% = 25%

Discount $= \frac{25}{100} \times x = \frac{x}{4}$

S.P. = M.P - Discount

$405 = x - \frac{x}{4} = \frac{3x}{4}$

$x = \frac{4 \times 405}{3} = 4 \times 135$

x = ₹ 540.

Therefore, the marked price of the article is ₹ 540.

31. $(4x^2 - 3x + 2) + (3x^2 + 4x - 8) = 4x^2 - 3x + 2 + 3x^2 + 4x - 8$

$= 4x^2 + 3x^2 + 4x - 3x + 2 - 8$

$= (4 + 3)\, x^2 + (4 - 3)x + (2 - 8)$

$= 7x^2 + x - 6$

32. l = 15 m

b = 10 m

h = 7 m

Surface area to be painted

$= 2 (l \times b + b \times h + h \times l) - l \times b$

$= 2 (15 \times 10 + 10 \times 7 + 7 \times 15) m^2 - (15 \times 10)\ m^2$

$= 2(150 + 70 + 105)\ m^2 - 150\ m^2$

$= 2\ (325)\ m^2 - 150\ m^2$

$= 650\ m^2 - 150\ m^2$

$= 500\ m^2$

∴ Number of cans needed

$= \frac{Surface\ area\ to\ be\ painted}{Area\ painted\ by\ 1\ can}$

$= \frac{500}{100}$

= 5

Hence, she will need 5 cans to paint the room.

33. a. Given, 1 light year = 9,460,000,000,000 km

For standard form = 946×10^{10} km = $\frac{946}{100} \times 10^{10} \times 100$ km

$= 9.46 \times 10^{12}$ km

b. The average distance between Earth and Sun = 1.496×108 km

∴ Distance between Earth and Sun = $\frac{1.496}{10000} \times 10^8 \times 10^4$ km = 0.0001496×10^{12} km

Since, 9.46 > 0.0001496

So, the distance between Earth and Sun-less than one light-year.

34. $a^4 - 2a^2b^2 + b^4$

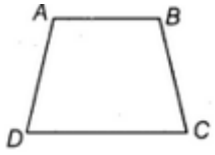
$= (a^2)^2 - 2(a^2)\ (b^2) + (b^2)^2$

$= (a^2 - b^2)^2$ . . . . [Using Identity II

$= \{(a - b)\ (a + b)^2\}$. . . . [Using Identity III

$= (a - b)^2\ (a + b)^2$.

35. Let ABCD be a trapezium, where AB || CD.



Let the angles A and D be of measures 2x and x, respectively

then $2x + x = 180^o$

[∵ in trapezium, the angles on either side of the base are supplementary]

$\Rightarrow 3x = 180^o$

$\Rightarrow x = 60^o$

∴ $\angle A = 2x = 60^o = 120^o$, $\angle D = 60^o$

Again, let the angles B and C be 7x and 5x respectively. Then $7x + 5x = 180^o$

$\Rightarrow 12x = 180^o$

$\Rightarrow x = 15^o$

Thus, $\angle B = 7 \times 15 = 105^o$ and $\angle C = 5 \times 15 = 75^o$

OR

i. Yes (opposite sides of a rectangle)

ii. Yes, since, AB ‖ CD, AC is a transversal and they are alternate angles.

iii. Since DQ and BP are perpendiculars from D and B, respectively on AC, therefore, ∠DQA = ∠BPC = 90°.
Thus DQ ‖ BP (if the alternate angles are equal the lines are parallel)
Also AD ‖ BC and AC is the transversal.
∴ ∠DAQ = ∠BCP (Alternate angles)
Since ∠DQA = ∠BPC and ∠DAQ = ∠BCP,
∴ ∠ADQ = ∠CBP
Now in ΔDAQ and ΔBCP, we have
∠DAQ = ∠BCP
∠ADQ = ∠CBP
DA = BC
∴ ΔDAQ ≅ ΔBCP (by ASA condition of congruence)

iv. Yes, (corresponding parts of congruent triangle ΔDAQ and ΔBCP)

36. a. Number of children who spend atleast 1 h in playing games i.e. the number of children playing 1 h or more than 1 h
= (Total number of children) - (Number of children spend less than 1 h)
= 350 -6 % of 350
$= 350 - \frac{6}{100} \times 350$
= 350-21 = 329

b. Number of children who spend more than 2 h in playing games
= (34 + 10 + 4)% of the total number of students
= 48% of 350
$= \frac{48}{100} \times 350 = 168$

c. Number of children who spend 3 or lesser hours in playing games
= (34 + 30 + 16 + 6)%of total number of students
= 86% of 350
$= \frac{86}{100} \times 350 = 301$

d. Number of children who spend 2 h or more per day in playing games
= (30 + 34 + 10 + 4)%of total number of students
= 78% of total number of students
Number of children who spend less than one hour = 6% of total number of students Clearly, number of children who play for 2 h or more per day is greater than the number of children who play for less than 1 h.

37. From the given data in the table,
Rate of one packet of atta = ₹200
Discount % = 16%
So, price after discount = 200 - $\frac{16}{100} \times 200$
= 200 - 32
= ₹168
Rate of one packet of detergent = ₹371
Discount % = 22.10%
So, price after discount = 371 - 371 $\times \frac{22.10}{100}$
= 371 - 81.991
= ₹289.009
Rate of one packet of namkeen = 153
Discount% = 18.30%
So, price after discount = 153 - 153 $\times \frac{18.30}{100}$
= 153- 1.53 $\times$ 18.30
= 153 - 27.999

= ₹125.001

∴ Total bill amount to be paid = ₹168 + ₹289.009 + ₹125.001

= ₹582.01

OR

Let Principal = P

Rate of Interest = R

Amount$_1$ (A_1) = ₹ 17,640

Time Period1 (T_1) = 2 years

$A_1 = P\left(1 + \frac{R}{100}\right)^{T_1}$

$17,640 = P\left(1 + \frac{R}{100}\right)^2$

Amount$_2$ (A_2) = ₹ 18,522

Time Period$_2$ (T_2) = 3 years

$A_2 = P\left(1 + \frac{R}{100}\right)^{T_2}$

$18,522 = P\left(1 + \frac{R}{100}\right)^3$

$\frac{A_1}{A_2} = \frac{18,522}{17,640} = \frac{P(1+\frac{R}{100})^3}{P(1+\frac{R}{100})^2}$

$\frac{21}{20} = \frac{(1+\frac{R}{100})^3}{(1+\frac{R}{100})^2} = 1 + \frac{R}{100}$

$\frac{21}{20} - 1 = \frac{R}{100}$

$R = \frac{21-20}{20} \times 100 = \frac{1}{20} \times 100 == 5\%$

38. Here l = 10 cm, w = 8 cm and h = 7 cm

Using formula LSA = 2h(l + w)

= 2 × 7(10 + 8)

= 14(18) = 252 cm^2

39. Suppose the amount of sugar is x kg and the number of crystals is y

As the amount of sugar increases, the number of crystals also increases in the same ratio. It is a case of direct proportion. We make use of the relation of the type $\frac{x_1}{y_1} = \frac{x_2}{y_2}$

(i) Here,

$x_1 = 2$

$y_1 = 9 \times 10^6$

$x_2 = 5$

Therefore, $\frac{x_1}{y_1} = \frac{x_2}{y_2}$ gives

$\frac{2}{9\times10^6} = \frac{5}{y_2}$

$\therefore 2y_2 = 5 \times 9 \times 10^6$

$\therefore y_2 = \frac{5\times9\times10^6}{2}$

$\therefore y_2 = 22.5 \times 10^6$

$\therefore y_2 = 2.25 \times 10^7$

Hence, there are 225×10^5 crystals.

(ii) Here,

$x_1 = 2$

$y_1 = 9 \times 10^6$

$x_2 = 1.2$

Therefore, $\frac{x_1}{y_1} = \frac{x_3}{y_3}$ gives

$= \frac{2}{9\times10^6} = \frac{12}{y_3}$

$\therefore 2y_3 = 1.2 \times 9 \times 10^6$

$\therefore 2y_3 = 10.8 \times 10^6$

$\therefore y_3 = \frac{10.8 \times 10^6}{2}$

$\therefore y_3 = 5.4 \times 10^6$

Hence, these are 54×10^5 crystals.

40.

Hours of ride	Distance covered by scooter
1 hour	1×30 km = 30 km
2 hours	$2 \times$ 30 km = 60 km
3 hours	$3 \times$ 30 km = 90 km
4 hours	$4 \times$ 30 km = 120 km and so on.

We get a table of these values as follows:

Time (in hours)	1	2	3	4
Distance covered (in km)	30	60	90	120

i. Scale: (Fig) Horizontal: 2 units = 1 hour, Vertical: 1 unit = 10 km

ii. Mark time on the horizontal axis.

iii. Mark distance on the vertical axis.

iv. Plot the points: (1, 30), (2, 60), (3, 90), (4, 120)

v. Join the points. We get a linear graph.

a. Corresponding to 75 km on the vertical axis, we get the time to be 2.5 hours on the horizontal axis. Thus 2.5 hours are needed to cover 75 km.

b. Corresponding to $3\frac{1}{2}$, hours on the horizontal axis, the distance covered is 105 km on the vertical axis.