Class VIII Session 2024-25
Subject - Mathematics
Sample Question Paper - 5

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. To get the product 1, we should multiply $\frac{8}{21}$ by: **[1]**

   a) $\frac{8}{21}$ b) $\frac{-21}{8}$

   c) $\frac{-8}{21}$ d) $\frac{21}{8}$

2. The numerical expression $\frac{3}{8} + (\frac{-5}{7}) = \frac{-19}{56}$ shows that **[1]**

   a) addition of rational numbers is not commutative b) rational numbers are not closed under addition

   c) rational numbers are closed under multiplication d) rational numbers are closed under addition

3. If $x - \frac{1}{x-2} = 2 - \frac{1}{x-2}$, then x is equal to **[1]**

   a) 1 b) 4

   c) 3 d) 2

4. Solve the equation: 2x - 3 = x + 2 **[1]**

   a) 5 b) 0

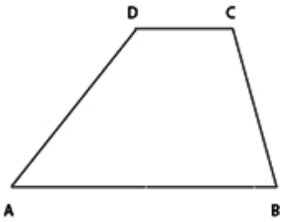
   c) 4 d) 3

5. If the interior angle of a regular polygon is 108°. The polygon has _____ sides. **[1]**

   a) 5 b) 4

   c) 6 d) 10

6. The measure of the angles of a quadrilateral ABCD are respectively in the ratio 1 : 2 : 3 : 4. Find the type of quadrilateral ABCD. **[1]**



a) Square

b) Parralelogram

c) Rectangle

d) Trapezium

7. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball. The number of blue balls in the bag is **[1]**

a) 7

b) 9

c) 10

d) 8

8. Which of the following is a Pythagorean triplet? **[1]**

a) (5, 16, 19)

b) (5, 12, 18)

c) (6, 8, 10)

d) (3, 4, 7)

9. The least number to be added to 269 to make it a perfect square is **[1]**

a) 20

b) 17

c) 31

d) 16

10. Find the prime factorisation of 6859. **[1]**

a) 6^8

b) 34^7

c) 23^3

d) 19^3

11. The unit digit in cube of 143 is **[1]**

a) 9

b) 1

c) 3

d) 7

12. A bag contains Rs 600 in the form of 1- rupee, 50 paise and 25 paise coins in the ratio 3 : 4 : 12, the number of 25 paise coins is: **[1]**

a) 900

b) 1376

c) 1200

d) 600

13. ₹ 8000 invested at compound interest gives ₹ 1261 as interest after 3 years. The rate of interest per annum is: **[1]**

a) 25%

b) 5%

c) 17.5%

d) 10%

14. Add: 5m (3 - m) and $6m^2$ - 13m. **[1]**

a) m^2 - 2m

b) m^2 + 2m

c) 4m - 5

d) m^2 + 5m

15. Evaluate: $\left(\frac{x}{2}+\frac{y}{3}\right)\left(\frac{x}{2}+\frac{y}{3}\right)$ **[1]**

a) $\frac{x^2}{4}+\frac{xy}{6}+\frac{y^2}{9}$

b) $\frac{x^2}{4}+\frac{2xy}{3}+\frac{y^2}{9}$

c) $\frac{x^2}{4} + \frac{(x+y)}{6} + \frac{y^2}{9}$

d) $\frac{x^2}{4} + \frac{xy}{3} + \frac{y^2}{9}$

16. What are the three views in a solid? **[1]**

a) front and top

b) side and front

c) top and side

d) top, side and front

17. The sum of the radius of the base and the height of a cylinder is 37 m. If the total surface area of the solid cylinder is 1628 m^2. The circumference of base of cylinder is **[1]**

a) 33 m

b) 44 m

c) 22 m

d) 11 m

18. The dimensions of an iron box are 9ft $\times$ 4.4ft $\times$ 2.5ft. What is the cost of the iron sheet used to make the box, if the cost of the sheet is Rs 6 per square foot? **[1]**

a) Rs 887.2

b) Rs 977.2

c) Rs 777.2

d) Rs 877.2

19. One of the factors of 4(x + y) (3a - b) + 6(x + y) (2b - 3a) is **[1]**

a) (4a - 3b)

b) (3a - b)

c) (2b - 3a)

d) (-3a + 4b)

20. Factorise: $4y^2 - 12y + 9$ **[1]**

a) $(5y - 3)^2$

b) $(7y - 5)^2$

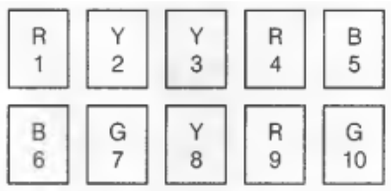
c) $(2y - 3)^2$

d) $(2y - 5)^2$

Section B

21. The ratio of exterior angle to interior angle of a regular polygon is 1 : 4. Find the number of sides of the polygon. **[2]**

22. Sonia picks up a card from the given cards **[2]**



Find the probability of getting

a. an odd number

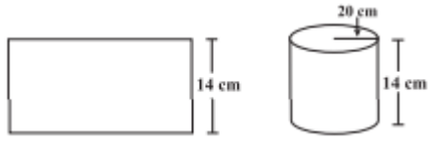
b. a Y card

c. a G card

d. a B card bearing number greater than 7

23. Find if 2025 is a perfect cube? **[2]**

24. A rectangular paper of width 14 cm is rolled along its width and a cylinder of radius 20 cm is formed. Find the volume of the cylinder as shown in Fig. (Take $\frac{22}{7}$ for π) **[2]**



OR

A housing society consisting of 5500 people, needs 100 L of water per person per day. The cylindrical supply tank is

7 m high and has a diameter of 10 m. For how many days will the water in the tank last for the society?

25. Find the value of x in the expression $2^x + 2^x + 2^x = 192$ **[2]**

26. From the following table, determine if x and y are in direct proportion or not. **[2]**

x	4	7	10	16
y	24	42	60	96

OR

A contractor undertook a contract to complete a part of a stadium in 9 months with a team of 560 persons. Later on, it was required to complete the job in 5 months. How many extra persons should he employ to complete the work?

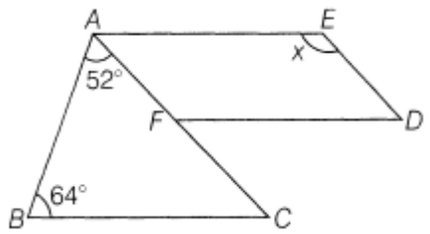
27. Simplify: $\left(-5 \times \frac{2}{15}\right) - \left(-6 \times \frac{2}{9}\right)$ **[3]**

28. Solve the equation and check your result: $8x + 4 = 3(x - 1) + 7$ **[3]**

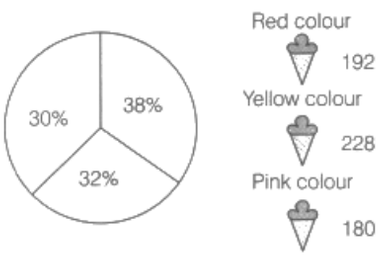
29. ABCD is a parallelogram. The bisector of angle A intersects CD at X and bisector of angle C intersects AB at Y. **[3]**
Is AXCY a parallelogram? Give reason.

OR

In the following figure, FD || BC || AE and AC || ED. Find the value of x.



30. Identify which symbol should appear in each sector of the given pie chart. **[3]**



31. Find the least number which must be subtracted from 4000 so as to get a perfect square. Also find the square root of the perfect square so obtained. **[3]**

32. Arun bought a pair of skates at a sale where the discount given was 20%. If the amount he pays is ₹1600, find the marked price. **[3]**

33. Find the volume of rectangular box with sides are $4p^2q^3$, 3pq and $2p^2q$. **[3]**

OR

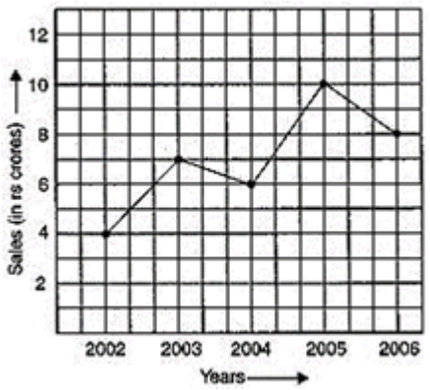
Find the sum of $4x^2 - 3x + 2$ and $3x^2 + 4x - 8$.

34. The following line graph shows the yearly sales figures for a manufacturing company. **[3]**

i. What were the sales in (a) 2002 (b) 2006?

ii. What were the sales in (a) 2003 (b) 2005?

iii. Compute the difference between the sales in 2002 and 2006.



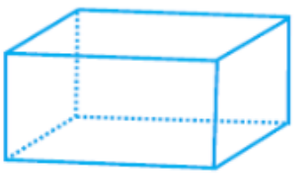
35. Calculate the amount and compound interest on ₹10,800 for 3 years at $12\frac{1}{2}\%$ per annum compounded annually. **[4]**

OR

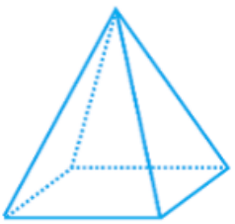
Raheem runs a readymade garment shop. He mark the garments at such a price that even after allowing a discount of 12.5%, gain a profit of 25%. Find the marked price of a jacket which costs him Rs. 2,100.

36. Draw the front, side and top view of the given shapes. **[4]**

a.



b.



37. Find the total surface area and volume of a cube with base perimeter equal to 40 cm. **[4]**

38. Simplify : $\frac{3^{-5}\times10^{-5}\times125}{5^{-7}\times6^{-5}}$ **[4]**

OR

Simplify $\left[\left(\frac{6}{7}\right)^{-1}-\left(\frac{1}{6}\right)^{-1}\right]^{-1}\div 29^{-1}$.

39. If y varies directly with x, write an equation for the direct variation. **[4]**

Then find each value.

a. If y = -12 when x = 9, find y when x = -3.

b. Find y when x = 10 if y = 8 when x = 20.

40. Factorize $12x^3y^4+16x^2y^5-4x^5y^2$ **[4]**

Solution

Section A

1. **(d)** $\frac{21}{8}$

Explanation: Let we should multiply $\frac{8}{21}$ by x. Then, according to question, $x \times \frac{8}{21} = 1$

Hence, we should multiply $\frac{8}{21}$ by $\frac{21}{8}$, for getting the product 1

2. **(d)** rational numbers are closed under addition

Explanation: In the given expression the addition of two rational numbers is given and the result obtained is also a rational number.

3. **(d)** 2

Explanation: $x - \frac{1}{x-2} = 2 - \frac{1}{x-2}$

$\Rightarrow x = 2 - \frac{1}{x-2} + \frac{1}{x-2} \Rightarrow$ x = 2

4. **(a)** 5

Explanation: 2x - 3 = x + 2

By transposig both sides

2x - x = 2 + 3

x = 5

5. **(a)** 5

Explanation: $\because$ Each interior angle of a polygon = $\frac{2(n-2)\times 90^\circ}{n}$

$108^\circ = \frac{2(n-2)\times 90^\circ}{n}$

$\Rightarrow 108^o n = 180^o n - 360^o$

$\Rightarrow 72n = 360^\circ$

$\therefore$ n = 5

Hence, total sides of a polygon = 5

6. **(d)** Trapezium

Explanation: Let the ratio of angles be 'x'

$\therefore \angle A = x, \angle B = 2x,$

$\angle C = 3x, \angle D = 4x,$

$x + 2x + 3x + 4x = 360^o$

$10x = 360^o$

$x = 36^0$

$\therefore \angle A = 36^o, \angle B = 72^o$

$\angle C = 180^o, \angle D = 144^o$

Now we see that

$\angle A + \angle D = 180^o$ and $\angle B + \angle C = 180^o$

It shows that AB || DC

$\therefore$ ABCD is a trapezium.

7. **(c)** 10

Explanation: 10

8. **(c)** (6, 8, 10)

Explanation: General form is $(2m, m^2 - 1, m^2 + 1)$

Put m = 3

So $2m = 6$, $m^2 - 1 = 32 - 1 = 8$,

$m^2 + 1 = 3^2 + 1 = 10$

∴ (6, 8, 10) is a Pythagorean triplet.

9. **(a)** 20

Explanation: We know, $256 < 269 < 289$

$\Rightarrow (16)^2 < 269 < (17)^2$

∴ Number to be added $= (17)^2 - 269$

$= 289 - 269 = 20$

10.

(d) 19^3

Explanation: $6859 = 19 \times 19 \times 19$

$= 19^3$

11.

(d) 7

Explanation: Unit digit in cube of 143 = unit digit of $(143)^2$

= Unit digit of $(3)^3$

= Unit digit of 27

= 7

12. **(a)** 900

Explanation: Let x = 1 rupee coin, y = 50 paise coin, z = 25 paise coin

$\therefore ₹ \left(x + \frac{y}{2} + \frac{z}{4}\right) = ₹ 600$

$\Rightarrow 4x + 2y + z = 2400$ ...(i)

Also, let x = 3k, y = 4k, z = 12k

∴ From (i)

$4(3k) + 2(4k) + 12k = 2400$

$\Rightarrow 12k + 8k + 12k = 2400 \Rightarrow 32k = 2400$

$\Rightarrow k = \frac{2400}{32} = 75$

∴ Number of 25-paise coin = 12(k)

$= 12 \times 75 = 900$

13.

(b) 5%

Explanation: P = ₹ 8000, C.I. = ₹ 1261

$\Rightarrow$ Amount = ₹ 9261, n = 3, r = ?

$\therefore 9261 = 8000\left(1 + \frac{r}{100}\right)^3$

$\Rightarrow \left(1 + \frac{r}{100}\right)^3 = \frac{9261}{8000} = \left(\frac{21}{20}\right)^3$

$\Rightarrow 1 + \frac{r}{100} = \frac{21}{20}$

$\Rightarrow \frac{r}{100} = \frac{21}{20} - 1 = \frac{1}{20}$

$\Rightarrow r = \frac{100}{20}\% = 5\%$ P.a.

14.

(b) $m^2 + 2m$

Explanation: $5m (3 – m) + 6m^2 - 13m$

open brackets we get,

$15m - 5m^2 + 6m^2 - 13m$

solving like terms we get,

$-5m^2 + 6m^2 + 15m - 13m$

$m^2 + 2m$

15.

(d) $\frac{x^2}{4} + \frac{xy}{3} + \frac{y^2}{9}$

Explanation: $\left(\frac{x}{2} + \frac{y}{3}\right)\left(\frac{x}{2} + \frac{y}{3}\right) = \left(\frac{x}{2} + \frac{y}{3}\right)^2$

$= \left(\frac{x}{2}\right)^2 + 2\left(\frac{x}{2}\right) \times \left(\frac{y}{3}\right) + \left(\frac{y}{3}\right)^2$

$\Rightarrow \left(\frac{x}{2} + \frac{y}{3}\right)\left(\frac{x}{2} + \frac{y}{3}\right) = \frac{x^2}{4} + \frac{xy}{3} + \frac{y^2}{9}$

16.

(d) top, side and front

Explanation: The three views of solid structures are front view, top view and side view.

17.

(b) 44 m

Explanation: Given, r + h = 37 m

and total surface area = 1628 m^2

$= 2\pi r (h + r) = 1628\ m^2 \Rightarrow 2\pi r (37) = 1628$

$\Rightarrow r = \frac{1628 \times 7}{2 \times 22 \times 37} = 7$

$\therefore$ Circumference of its base $= 2\pi r$

$= 2 \times \frac{22}{7} \times 7 = 44$ m

18.

(d) Rs 877.2

Explanation: length of iron box = 9 ft , breadth = 4.4 ft , height = 2.5 ft

Surface area of iron box = $2(l \times b + b \times h + h \times l)$

$S = 2(9 \times 4.4 + 4.4 \times 2.5 + 2.5 \times 9)$

$S = 2(39.6 + 11 + 22.5)$

$S = 2(73.1) = 2 \times 73.1 = 146.2 ft^2$

Surface area of iron box = 146.2 ft^2

The cost of the sheet per square foot = Rs 6

The cost of the sheet 146.2 $ft^2 = 6 \times 146.2$ = Rs 877.2

The cost is Rs 877.2

19.

(d) (-3a + 4b)

Explanation: We have, 4(x + y) (3a - b) + 6(x + y) (2b - 3a)

= 2(x + y) [2(3a - b) + 3(2b - 3a)]

= 2(x + y) [6a - 2b + 6b - 9a] = 2(x + y) (-3a + 4b)

20.

(c) $(2y - 3)^2$

Explanation: $4y^2 - 12y + 9$

By middle split term

$= 4y^2 - 6y - 6y + 9$

By grouping

$= 2y(2y - 3) - (2y - 3)$

$= (2y - 3)(2y - 3)$

$= (2y - 3)^2$

Section B

21. Let the exterior angle of the polygon be x

Then, the interior angle of polygon = $180^o - x$ [$\because$Sum of interior angle and exterior angle = 180^0]

According to question,

$\frac{x}{180^\circ - x} = \frac{1}{4}$

or, 4x = 180^o - x

or, 4x = 180^o - x

or, 5x = 180^o

or, x = $\frac{180^\circ}{5}$

So, x = 36^o

Number of sides of polygon = $\frac{360^\circ}{\text{exterior angle}}$

$= \frac{360^\circ}{36^\circ}$

= 10

22. From the given information, it is clear that:

    a. The probability of getting an odd number = $\frac{\text{Number of events getting an odd number}}{\text{Total number of events}} = \frac{5}{10} = \frac{1}{2}$

    b. The probability of getting a Y card = $\frac{\text{Number of events getting a Y card}}{\text{Total number of events}} = \frac{3}{10}$

    c. The probability of getting a G card = $\frac{\text{Number of events getting a G card}}{\text{Total number of events}} = \frac{2}{10} = \frac{1}{5}$

    d. The probability of getting a B card bearing number greater than 7 = $\frac{\text{Number of events getting a B card bearing number greater than 7}}{\text{Total number of events}} = \frac{0}{10} = 0$

23.

3	2025
3	675
3	225
3	75
5	25
5	5
	1

By prime factorisation,

2025 = 3 × 3 × 3 × 3 × 5 × 5 [grouping the factors in triplets]

In the above factorisation, 3 and 5 × 5 remain after grouping 3's in triplets.

Therefore, 2025 is NOT a perfect cube.

24. A cylinder is formed by rolling a rectangle about its width. Hence the width of the paper becomes height and radius of the cylinder is 20 cm.

Height of the cylinder = h = 14 cm

Radius = r = 20 cm

Volume of the cylinder = V = $\pi r^2 h$

= $\frac{22}{7} \times 20 \times 20 \times 14$ = 17600 cm^3

Hence, the volume of the cylinder is 17600 cm^3.

OR

Total number of people = 5500

Water required per person per day = 100 L

Total requirement of water by 5500 people = 100 × 5500 = 550000 L

Height of the cylindrical tank = 7m

Diameter of the cylindrical tank = 10 m

Radius = 5 m $\left[\because \frac{\text{diameter}}{2} = \text{radius}\right]$

Volume of cylinder = $\pi r^2 h = \frac{22}{7} \times 5 \times 5 \times 7$

= 22 × 25 = 550 m^3

diameter = radius = 550 × 1000= 550000 L [$\because$ 1 m^3 = 1000 L]

Hence, for 1 day the water in the tank lost for the society and in one day society needs 550000 L of water.

25. We have, $2^x + 2^x + 2^x = 192$

$= 2^x (1 + 1 + 1) = 192$

$= 3 \times (2^x) = 192$

$\Rightarrow \quad 2^x = \frac{192}{3} = 64$

$\Rightarrow 2^x = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$\Rightarrow 2^x = 2^6$

On comparing the powers of 2, we get x = 6

26.

x	4	7	10	16
y	24	42	60	96

$\Rightarrow \frac{x}{y} = \frac{4}{24}, \frac{7}{42}, \frac{10}{60}, \frac{16}{96}$

$\frac{1}{6}, \frac{1}{6}, \frac{1}{6}, \frac{1}{6}$

So, It is clear that x and y are in direct proportion.

OR

$\because$ In 9 months, a part of the stadium can complete by 560 persons

$\therefore$ In 1 month, the work can be completed by $9 \times 560 = 5040$persons 5040

$\because$ In 5 months, the work can be completed by $\frac{5040}{5}$ = 1008 persons

Now, the number of extra persons required to complete the work in 5 months = 1008 - 560 = 448

27. $\left(\frac{-10}{15}\right) - \left(\frac{-12}{9}\right)$

$= \frac{[-30-(-60)]}{45}$

$= \frac{[-30+60]}{45}$

$= \frac{30}{45} = \frac{2}{3}$

28. 8x + 4 = 3(x – 1) + 7

$\therefore$ 8x + 4 = 3x – 3 + 7

$\therefore$ 8x + 4 = 3x + 4

$\therefore$ 8x – 3x = 4 – 4 ... [Transposing 3x to L.H.S. and 4 to R.H.S.]

$\therefore$ 5x = 0

$\therefore$ x = $\frac{0}{5}$ ... [Dividing both sides by 5]

$\therefore$ x = 0 this is the required solution.

Verification,

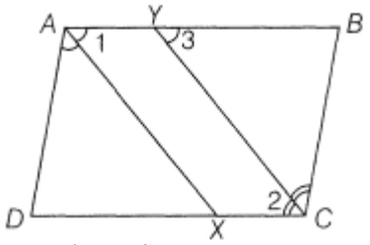
L.H.S. = 8x + 4 = 8(0) + 4 = 4

R.H.S. = 3(x – 1) + 7 = 3(0 – 1) + 7 = 3(–1) + 7 = –3 + 7 = 4

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

29. Given, ABCD is a parallelogram.

So, $\angle A = \angle C$ [$\because$ opposite angles of a parallelogram are equal]



$\therefore \quad \frac{\angle A}{2} = \frac{\angle C}{2}$ [dividing both the sides by 2]

$\angle 1 = \angle 2$ [alternate angles]

But $\angle 2 = \angle 3$ [$\because$ AB || CD and CY is the transversal]

$\therefore \angle 1 = \angle 3$

But they are pair of corresponding angles.

$\therefore$ AX || YC ....(i)

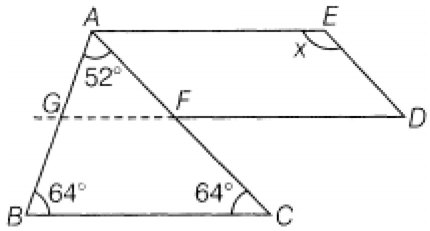
AY || XC [$\because$ AB || DC] ...(ii)

From Eqs. (i) and (ii), we get

AXCY s a parallelogram.

OR

Produce DF such that it intersects AB at G.



In △ABC,

∠A+ ∠B+ ∠C = 180° [angle sum property of triangle]

⇒ 52° + 64° + ∠C = 180°

∠C = 180° - (52° + 64°) = 180° - 116° = 64°

Now, we see that, DG II BC and DG II AE

∴ ∠ACB = ∠AFG

⇒ 64° = ∠AFG

Also, GFD is a straight line.

∴ ∠GFA + ∠AFD = 180° [linear pair]

⇒ 64° + ∠AFD- 180°

⇒ ∠AFD = 180° - 64° = 116°

Also, FD||AE and AF||ED

So, AEDF is a parallelogram.

∴ ∠AFD = ∠AED [∵ opposite angles in a parallelogram are equal]

⇒ ∠AED = x = 116°

30. Total quantity obtained from the given three colours = 192 + 228 + 180 = 600

Also, 600 = 100%

or $1 = \frac{100}{600}\% = \frac{1}{6}\%$

or 192 = $\frac{1}{6} \times 192$ = 32%

or 228 = $\frac{1}{6} \times 228$ = 38%

or 180 = $\frac{1}{6} \times 180$ = 30%

∴ 

31.

	63
6	$\overline{40}\ \overline{00}$
	− 36
123	4 00
	− 3 69
	31

This shows that 63^2 is less than 4000 by 31. This means, if we subtract the remainder from the number, we get a perfect square,

So, the required least number is 31.

Therefore, the required perfect square is 4000 – 31 = 3969.

Hence, $\sqrt{3969}$=63.

32. Let the marked price be ₹ x

Then discount given = 20% of ₹ x

$= ₹\frac{20}{100} \times x$

$= ₹\frac{x}{5}$

∴ Sale Price = Marked price – Discount

$= ₹x - ₹\frac{x}{5}$

$= ₹\frac{4x}{5}$

According to the question,

$\frac{4x}{5} = 1600$

$\therefore x = \frac{1600 \times 5}{4}$

$\therefore$ x = 2000

Hence, the marked price of the pair of skates is ₹ 2000.

33. Volume of rectangular box = l × b × h

$= (4p^2q^3) \times (3pq) \times (2p^2q)$

$= (4 \times 3 \times 2)\ (p^2q^3 \times pq \times p^2q)$

$= 24\ p^5q^5$

OR

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

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

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

$= 7x^2 + x - 6$

34. i. The sales in (a) 2002 were Rs. 4 crore and in (b) 2006 were Rs. 8 crore.

ii. The sales in (a) 2003 were Rs. 7 crore and in (b) 2005 were Rs. 10 crore.

iii. The difference between the sales in 2002 and 2006

Rs. 8 crore – Rs. 4 crore.

= Rs. 4 crore.

35. By using year by year calculation

S.I. on ₹ 10800 at $12\frac{1}{2}\%$ per annum for 1 year

$= 10800 \times \frac{25}{2} \times \frac{1}{100}$ = ₹1350

$\therefore$ Amount at the end of 1st year

= ₹ 10800 + ₹ 1350 (A = P + S.I.)

= ₹ 12150

= Principle for 2nd year. S.I. on ₹ 12150 at $12\frac{1}{2}\%$ per annum for 1 year

$= 12150 \times \frac{25}{2} \times \frac{1}{100}$

= ₹ 1518.75

$\therefore$ Amount at the end of 2nd year

= ₹ 12150 + ₹ 1518.75

= ₹ 13668.75

= Principle for 3rd year

S.I. on ₹ 13668.75 at $12\frac{1}{2}\%$ per annum for 1 year

$= 13668.75 \times \frac{25}{2} \times \frac{1}{100}$

= ₹ 1708.59

$\therefore$ Amount at the end of 3rd year

= ₹ 13668.75 + ₹ 1708.59

= ₹ 15377.34

this is the required amount.

Now,

C.I. = ₹ 15377.34 – ₹ 10800

= ₹ 4577.34

OR

C.I. = ₹ 1350 + ₹ 1518.75 + ₹ 1708.59

= ₹ 4577.34

OR

Let marked price of the garments = ₹ x

Discount% = 12.5%

Discount = 12.5% of x $= \frac{125}{10 \times 100} \times x = \frac{1}{8} \times x = \frac{x}{8}$

S.P. = M.P. - Discount

$= x - \frac{x}{8} = \frac{8x - x}{8} = \frac{7x}{8}$

C.P. = ₹ 2,100

Gain% = 25%

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

$= \frac{100+25}{100} \times 2100 = \frac{125}{100} \times 2,100 = ₹.2,625$

Therefore, $\frac{7x}{8}$ = ₹ 2,625

$x = \frac{2625 \times 8}{7} = 375 \times 8 = ₹3,000$

Hence, Marked Price of Garments = ₹3,000.

36. a. Front view

Side view

Top view

b. Front view

Side view

Top view

37. Given

Perimeter of base = 40 cm

So length of side (a) = 40 ÷ 4 = 10 cm

Now, surface area = $6a^2$

= 6×10^2

= $600cm^2$

Volume of cube = a^3

= 10^3

= 1000 cm^3

38. $\frac{3^{-5}\times10^{-5}\times125}{5^{-7}\times6^{-5}}$

$= \frac{3^{-5}\times(2\times5)^{-5}\times(5\times5\times5)}{5^{-7}\times(2\times3)^{-5}}$

$= \frac{3^{-5}\times2^{-5}\times5^{-5}\times5^{3}}{5^{-7}\times2^{-5}\times3^{-5}}$

$= \frac{5^{-5}\times5^{3}}{5^{-7}}$

$= \frac{5^{(5)+3}}{5^{-7}}$

$= \frac{5^{-2}}{5^{-7}}$

$= 5^{(-2)-(-7)}$

$= 5^{-2+7}$

$= 5^{5}$

OR

$\left[\left(\frac{6}{7}\right)^{-1}-\left(\frac{1}{6}\right)^{-1}\right]^{-1}\div29^{-1} = \left[\frac{7}{6}-\frac{6}{1}\right]^{-1}\div\frac{1}{29}$

$= \left[\left(\frac{7-36}{6}\right)^{-1}\times\frac{1}{29}\right]$

$= \left[\left(\frac{-29}{6}\right)^{-1}\times29\right]$

$= \left[-\frac{6}{29}\times29\right]$

= - 6

39. a. y varies directly with x

y = kx

k = y/x

k = -12/9

k = -4/3

Now find y when x = -3

k = y/x

$\frac{-4}{3} = \frac{y}{-3}$

$y = \frac{-4\times-3}{3} = \frac{12}{3} = 4$

y = 4

b. y varies directly with x

$y \propto x$

y= kx

k = y/x

k = 8/20

k = 2/5

Now find y when x = 10

k = y/x

$\frac{2}{5} = \frac{y}{10}$

$y = \frac{2\times10}{5} = 4$

40. The greatest common factor of all the terms $12x^3y^4$,$16x^2y^5$ and $4x^5y^2$ of the expression $12x^3y^4 + 16x^2y^5 - 4x^5y^2$ is $4x^2y^2$.

Also, we can write

$12x^3y^4 = 4x^2y^2 \times 3xy^2$, $16x^2y^5 = 4x^2y^2 \times 4y^3$ and $4x^5y^2 = 4x^2y^2 \times x^3$

$\therefore 12x^3y^4 + 16x^2y^5 - 4x^5y^2 = 4x^2y^2 \times 3xy^2 + 4x^2y^2 \times 4y^3 - 4x^2y^2 \times x^3$

$= 4x^2y^2 (3xy^2 + 4y^3 - x^3)$