Class VIII Session 2025-26
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. Write the additive inverse of $\frac{9}{8}$. **[1]**

   a) $\frac{9}{8}$ b) $-\frac{9}{8}$

   c) 1 d) 0

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

   a) rational numbers are closed under multiplication b) rational numbers are closed under addition

   c) rational numbers are not closed under addition d) addition of rational numbers is not commutative

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

   a) 1 b) 2

   c) 3 d) 4

4. Solve: $a - \frac{a-1}{2} = 1 - \frac{a-2}{3}$ **[1]**

   a) $\frac{7}{5}$ b) 3

   c) 5 d) 7

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

   a) 10 b) 4

   c) 6 d) 5

6. The sum of all interior angles of a regular convex polygon is 1080^o. The measure of each of its interior angles is **[1]**

   a) 75^o b) 135^o

c) 108^o d) 120^o

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) 8 d) 10

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

a) (6, 8, 10) b) (5, 12, 18)

c) (3, 4, 7) d) (5, 16, 19)

9. Which of the following is not a perfect square? **[1]**
6084, 15625, 26894, 10404

a) 6084 b) 15625

c) 10404 d) 26894

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

a) 3 b) 9

c) 1 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) 600 b) 900

c) 1200 d) 1376

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

a) 5% b) 10%

c) 17.5% d) 25%

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. Subtract: 3x (x - 4y + 5z) from 4x (2x - 3y + 10z) **[1]**

a) $5x^2$ b) $5x^2$ + 25

c) 35 d) $5x^2$ + 25xz

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

a) top and side b) side and front

c) front and top 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) 11 m
b) 22 m
c) 33 m
d) 44 m

18. The total surface area of a cube is 1014 ft^2. What is the length of its edge? **[1]**

a) 11 ft
b) 15 ft
c) 13 ft
d) 9 ft

19. Simplify $\frac{49a^4b^6c^8}{7a^2b^2c^2}$ **[1]**

a) $7a^2b^4c^6$
b) $7a^4b^4c^6$
c) $7a^2b^2c^2$
d) $7a^4b^2c^6$

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

a) $(2y - 3)^2$
b) $(5y - 3)^2$
c) $(7y - 5)^2$
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]**

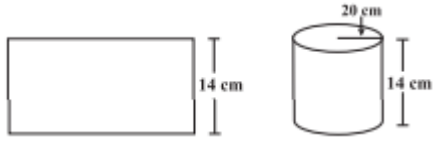
R 1	Y 2	Y 3	R 4	B 5
B 6	G 7	Y 8	R 9	G 10

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. Using prime factorisation, find the cube root of 512. **[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 x: $\left(\frac{2}{5}\right)^{2x+6} \times \left(\frac{2}{5}\right)^{3} = \left(\frac{2}{5}\right)^{x+2}$ **[2]**

26. The scale of a map is given as 1:30000000. Two cities are 4 cm apart on the map. Find the actual distance between them. **[2]**

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. Using appropriate properties find **[3]**

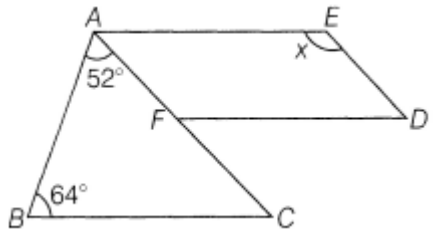
$-\frac{2}{3} \times \frac{3}{5} + \frac{5}{2} - \frac{3}{5} \times \frac{1}{6}$

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

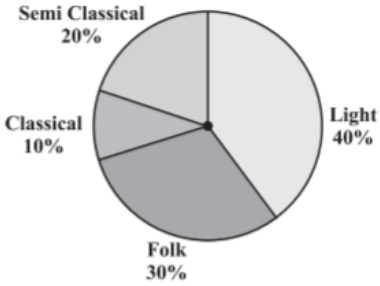
29. ABCD is a parallelogram. The bisector of angle A intersects CD at X and bisector of angle C intersects AB at Y. **[3]** Is AXCY a parallelogram? Give reason.

OR

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



30. A survey was made to find the type of music that a certain group of young people liked in a city. The adjoining pie chart shows the findings of this survey. **[3]**



From this pie chart answer. If a cassette company were to make 1000 CD's, how many of each type would they make?

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. What must be added to $2m^2 - 3mn + 3n^2$ to get $5m^2 + 2mn + 7n^2$? **[3]**

OR

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

34. The following table gives the growth chart of a child. **[3]**

Height (in cm)	75	90	110	120	130
Age (in years)	2	4	6	8	10

Draw a line graph for the table and answer the questions that follow:

a. What is the height at the age 5 yr?

b. How much taller was the child at the age of 10 yr than at the age of 6 yr?

c. Between which two consecutive periods did the child grow more faster?

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

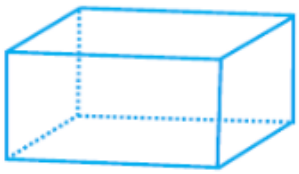
OR

Raheem runs a readymade garment shop. He mark the garments at such a price that even after allowing a discount of

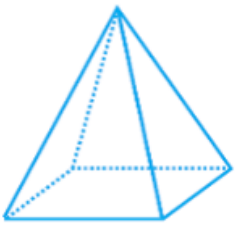
12.5%, gain a profit of 25%. Find the marked price of a jacket which costs him Rs. 2,100.

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.

(b) $-\frac{9}{8}$

Explanation:

The additive inverse of a number is the number which you add to the given number so that the resultant is zero.

So, Additive inverse of a number is number itself with a negative sign.

So, Additive inverse of $\frac{9}{8}$ is -$\frac{9}{8}$

$\frac{9}{8} + \frac{-9}{8} = 0$

2.

(b) 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.

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

Explanation:

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

By L.C.M on both sides

$or, \frac{2a-a+1}{2} = \frac{3-a+2}{3}$

$or, \frac{a+1}{2} = \frac{5-a}{3}$

By cross-multiply,

or, 3a + 3 = 10 - 2a

by transposing

or, 3a + 2a = 10 - 3

or, 5a = 7

or, a = $\frac{7}{5}$

5.

(d) 5

Explanation:

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

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

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

$\Rightarrow$ 72n = 360°

$\therefore$ n = 5

Hence, total sides of a polygon = 5

6.

(b) 135^o

Explanation:

The sum of all interior = 1080^o

$\Rightarrow$ (n - 2) $\times$ 180^o = 1080^o

$\Rightarrow$ n - 2 = 6

$\therefore$ n = 6 + 2 = 8

Interior angles = $\frac{1080}{8}$

= 135^o

7.

(d) 10

Explanation:

10

8. **(a)** (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

$\therefore$ (6, 8, 10) is a Pythagorean triplet.

9.

(d) 26894

Explanation:

26894

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) 7

Explanation:

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

= Unit digit of $(3)^3$

= Unit digit of 27

= 7

12.

(b) 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

$\therefore$ From (i)

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

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

= 2400

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

∴ Number of 25-paise coin = 12(k)
= 12 × 75 = 900

13. **(a)** 5%

Explanation:

P = ₹ 8000, C.I. = ₹ 1261

⇒ 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) $5x^2 + 25xz$

Explanation:

$[4x (2x – 3y + 10z)] - [3x (x – 4y + 5z)]$

opening big brackets we get,

$(8x^2 - 12xy + 40xz) - (3x^2 - 12xy + 15xz)$

open small brackets we get,

$(8x^2 - 12xy + 40xz) - 3x^2 + 12xy - 15xz$

$8x^2 - 3x^2 - 12xy + 12xy + 40xz - 15xz$

$5x^2 - 0 + 25xz$

$= 5x^2 + 25xz$

16.

(d) top, side and front

Explanation:

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

17.

(d) 44 m

Explanation:

Given, r + h = 37 m

and total surface area = 1628 m^2

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

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

∴ Circumference of its base = 2πr

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

18.

(c) 13 ft

Explanation:

Total surface area of cube = 1014 ft^2 and let the side of cube be x ft

Total surface area of cube = $6(side)^2$

$1014 = 6(x)^2$

$\frac{1014}{6} = x^2$

$169 = x^2$

$\sqrt{169} = x$

13ft = x = side

the length is 13 ft.

19. **(a)** $7a^2b^4c^6$

Explanation:

$\frac{49a^4b^6c^8}{7a^2b^2c^2}$

$= 7a^{4-2}\ b^{6-2}\ c^{8-2}$

$= 7a^2b^4c^6$

20. **(a)** $(2y - 3)^2$

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 [∵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. We have, 512

2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

Now, 512 = 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 × 2 (making triplets)

$\therefore \quad \sqrt[3]{512} = 2 \times 2 \times 2 = 8$

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, $\left(\frac{2}{5}\right)^{2x+6} \times \left(\frac{2}{5}\right)^3 = \left(\frac{2}{5}\right)^{x+2}$

Using law of exponents, $a^m \times a^n = (a)^{m+n}$ [$\because$ a is non-zero integer]

Then, $\left(\frac{2}{5}\right)^{2x+6+3} = \left(\frac{2}{5}\right)^{x+2}$

On comparing powers of $\left(\frac{2}{5}\right)$, we get

2x + 6 + 3 = x + 2

= 2x + 9 = x + 2

= x = - 7

26. Let the map distance be x cm and actual distance be y cm, then 1:30000000 = x : y

or $\frac{1}{3 \times 10^7} = \frac{x}{y}$

Since x = 4 so, $\frac{1}{3 \times 10^7} = \frac{4}{y}$

or y = $4 \times 3 \times 10^7 = 12 \times 10^7 cm$ = 1200 km.

Thus, two cities, which are 4 cm apart on the map, are actually 1200 km away from each other.

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 × 560= 5040persons 5040

∵ 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. We have, $-\frac{2}{3} \times \frac{3}{5} + \frac{5}{2} - \frac{3}{5} \times \frac{1}{6}$

$= \frac{-2}{3} \times \frac{3}{5} - \frac{3}{5} \times \frac{1}{6} + \frac{5}{2}$ (By regrouping)

$= \frac{3}{5} \times \left(\frac{-2}{3} - \frac{1}{6}\right) + \frac{5}{2}$ (Using distributive property)

$= \frac{3}{5} \times \left(\frac{-2\times2}{3\times2} - \frac{1\times1}{6\times1}\right) + \frac{5}{2}$

$= \frac{3}{5} \times \left(\frac{-4}{6} - \frac{1}{6}\right) + \frac{5}{2}$

$= \frac{3}{5} \times \left(\frac{-4-1}{6}\right) + \frac{5}{2}$

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

$= -\frac{1}{2} + \frac{5}{2} \left[\because \frac{3}{5} \times \frac{-5}{6} = \frac{-1}{2}\right]$

$= \left(\frac{-1+5}{2}\right)$

$= \frac{4}{2}$

$= 2$

Thus, the required value = 2

28. 8x + 4 = 3(x – 1) + 7

∴ 8x + 4 = 3x – 3 + 7

∴ 8x + 4 = 3x + 4

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

∴ 5x = 0

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

∴ x = 0 this is the required solution.

Verification,

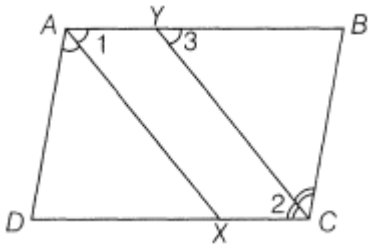
L.H.S. = 8x + 4 = 8(0) + 4 = 4

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, ∠A = ∠C [∵ opposite angles of a parallelogram are equal]



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

∠1 = ∠2 [alternate angles]

But ∠2 = ∠3 [∵ AB || CD and CY is the transversal]

∴ ∠1 = ∠3

But they are pair of corresponding angles.

∴ AX || YC ....(i)

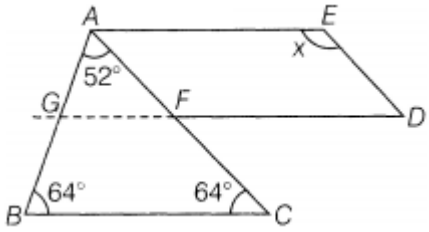
AY || XC [∵ AB || DC] ...(ii)

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. We have,

The total numbers of cassette = 1000

Number of CD's of semi-classical music = 20% of 1000

$= 1000 \times \frac{20}{100}$

$= 200$

Number of CD's of classical music = 10% of 1000

$= 1000 \times \frac{10}{100}$

$= 100$

Number of CD's of Folk music = 30% of 1000

$= 1000 \times \frac{30}{100}$

$= 300$

Number of CD's of Light music = 40% of 1000

$= 1000 \times \frac{40}{100}$

$= 400$

31.

```
      63
   ------------
 6 | 40 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. Let the number added is x ,

$(2m^2 - 3mn + 3n^2) + x = (5m^2 + 2mn + 7n^2)$

$x = (5m^2 + 2mn + 7n^2) - (2m^2 - 3mn + 3n^2)$

$x = 5m^2 + 2mn + 7n^2 - 2m^2 + 3mn - 3n^2$

$x = 3m^2 + 5mn + 4n^2$

So, the number is $3m^2 + 5mn + 4n^2$.

OR

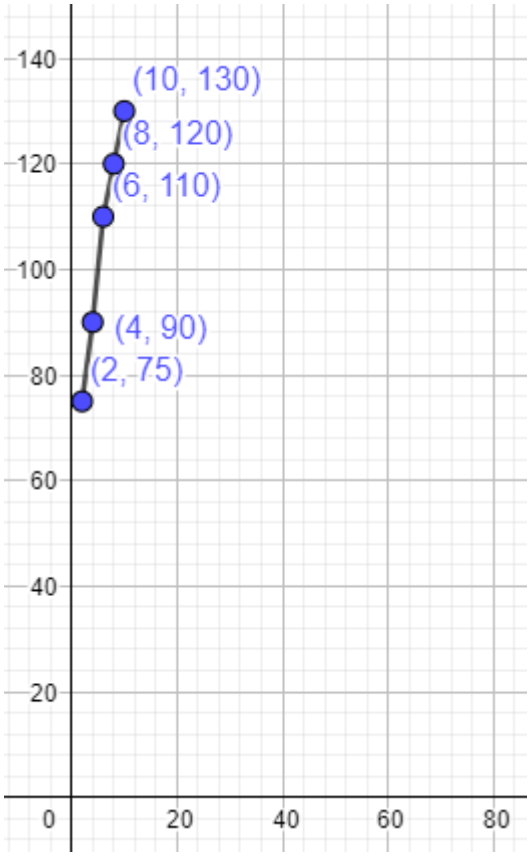
$(4x^2 - 3x + 2) + (3x^2 + 4x - 8) = 4x^2 - 3x + 2 + 3x^2 + 4x - 8$

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

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

$= 7x^2 + x - 6$

34.



a. At the age of 5 yr, the height is 100 cm.

b. At the age of 6 yr, child's height was 110 cm and at the age of 10 yr child's height was 130 cm. So, the child is 20 cm taller at the age of 10 yr than at the age of 6 yr.

c. Between 4 to 6 yr the child grow faster.

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

∴ 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

∴ 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 $= \frac{125}{10\times100} \times x = \frac{1}{8} \times x = \frac{x}{8}$

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

$x = \frac{2625\times8}{7} = 375 \times 8 = ₹3,000$

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. $\frac{3^{-5} \times 10^{-5} \times 125}{5^{-7} \times 6^{-5}}$

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

$= \frac{3^{-5} \times 2^{-5} \times 5^{-5} \times 5^3}{5^{-7} \times 2^{-5} \times 3^{-5}}$

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

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

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

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

$= 5^{-2+7}$

$= 5^5$

OR

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

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

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

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

= - 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

$y \alpha x$

y= kx

k = y/x

k = 8/20

k = 2/5

Now find y when x = 10

k = y/x

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

$y = \frac{2 \times 10}{5} = 4$

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 $4x^5y^2 = 4x^2y^2 \times x^3$

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

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