# Class VIII Session 2024-25
# Subject - Mathematics
# Sample Question Paper - 6

**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. $-\frac{19}{21} \times \left(-\frac{21}{19}\right)$ = _____. **[1]**

   a) $\frac{19}{21}$ b) 19

   c) 1 d) 21

2. $-\frac{17}{18} \times \left(-\frac{18}{17}\right)$ = _____. **[1]**

   a) 18 b) $\frac{18}{17}$

   c) 1 d) 17

3. Solve for x if kx + a = mx + b **[1]**

   a) $\frac{b-a}{k-m}$ b) $\frac{k-m}{a-b}$

   c) $\frac{m-k}{a-b}$ d) $\frac{a-b}{k-m}$

4. The number of boys and girls in a class is in the ratio 7:5. The number of boys is 8 more than the number of girls. What is the total class strength? **[1]**

   a) 45 b) 0

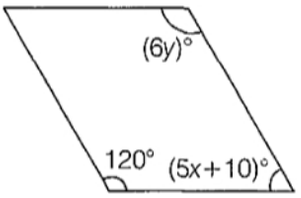
   c) 40 d) 48

5. The angles of a quadrilateral are in the ratio 1 : 2 : 3 : 4. The largest angle is **[1]**

   a) $108^o$ b) $72^o$

   c) $36^o$ d) $144^o$

6. The values of x and y in the following parallelogram is **[1]**




a) $90^o$, $110^o$

b) $60^o$, $80^o$

c) $80^o$, $110^o$

d) $10^o$, $20^o$

7. The number of diagonals in a polygon of n sides is **[1]**

a) n (n - 3)

b) $\frac{n(n-1)}{2}$

c) $\frac{n(n-3)}{2}$

d) $\frac{n(n-2)}{2}$

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

a) 2434

b) 1234

c) 1232

d) 1324

9. By which smallest number must 675 is divided, so that the quotient is a perfect cube? **[1]**

a) 9

b) 5

c) 25

d) 3

10. If $(125)^x = 3125$, then x equals **[1]**

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

b) $\frac{1}{4}$

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

d) $\frac{1}{5}$

11. The price of a washing machine is Rs 15,000. The sales tax charged on it is at the rate of 15%. Find the amount that Arjun will have to pay if he buys it. **[1]**

a) Rs 14,250

b) Rs 14,550

c) Rs 15,250

d) Rs 17,250

12. Multiply (x - y) and (3x + 5y). **[1]**

a) 2xy

b) $3x^2 + 2xy - 5y^2$

c) $5x^2 + 2xy - 5y^2$

d) $3x^2 + 2xy - 7y^2$

13. Height of a building is 9 m and this building is represented by 9 cm on a map. What is the scale used for the map? **[1]**

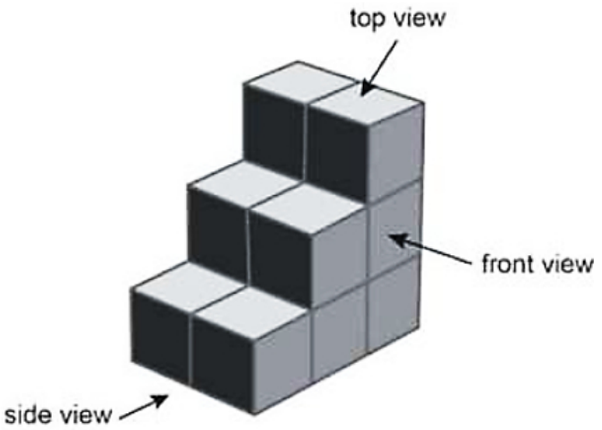
a) 1 : 100

b) 10 : 1

c) 100 : 1

d) 100 : 10

14. Which of the following shows the side view of the arrangement? **[1]**




Which of the following shows the side view of the arrangement?

a) 

b) 

c) 

d) 

15. The edges of a cuboid are in the ratio 1 : 2 : 3 and its total surface area is 198 $cm^2$. The volume of the cuboid is **[1]**

a) 162 $cm^3$

b) 81 $cm^3$

c) 36 $cm^3$

d) 27 $cm^3$

16. How many cubes of sides 6 cm can be fitted into a cuboid of volume 216 $m^3$? **[1]**

a) $10^5$

b) $10^3$

c) $10^4$

d) $10^6$

17. The value of $\frac{\left(-\frac{1}{2}\right)^5}{\left(-\frac{1}{2}\right)^4} \div \frac{\left(-\frac{1}{8}\right)}{\left(-\frac{1}{4}\right)}$ is _____. **[1]**

a) 0

b) 2

c) 1

d) -1

18. If $2^{m-7} = 32$, then find the value of $2^{m-3}$. **[1]**

a) 512

b) 1024

c) 2048

d) 256

19. 10 men working for 6 days mow an area of 5 acres. If there are 8 men working to mow 3 acres of land, how many days will it take? **[1]**

a) 4 days

b) 8 days

c) 12.5 days

d) 2 days

20. Asha can stitch **x** shirts in $\frac{3}{4}$ minutes. At this rate, how many shirts can she stitch in $\frac{3}{4}$th of an hour? **[1]**

a) 50x

b) $\frac{16}{9}x$

c) $\frac{9}{16}x$

d) 60x

## Section B

21. Solve: $\frac{5}{6} + \left(\frac{-2}{5}\right) - \left(\frac{-2}{15}\right)$. **[2]**

22. Solve the equation and check your result: 4z + 3 = 6 + 2z **[2]**

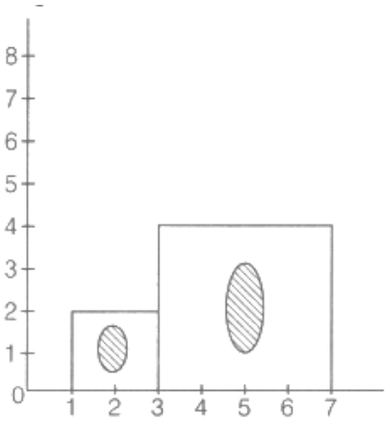
OR

Solve: $\frac{3t-2}{3} + \frac{2t+3}{2} = t + \frac{7}{6}$

23. What is the probability that a student chosen at random out of 3 girls and 4 boys is a boy? **[2]**

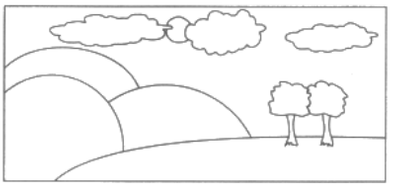
24. A decimal number is multiplied by itself. If the product is 51.84, then find the number. **[2]**

25. A photographer uses a computer program to enlarge a photograph. What is the scale according to which the width has enlarged in the given graph? **[2]**




OR

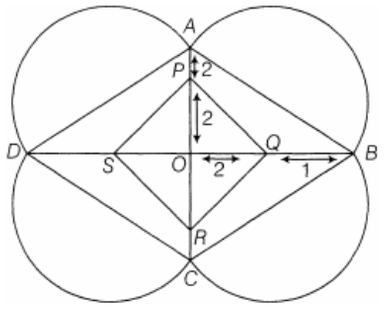
The actual length of a painting was 2m. What is the length in the photograph if the scale used is 1 mm : 20 cm.



26. Write 16250000000 in standard form. **[2]**

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

28. A rangoli has been drawn on the floor of a house. ABCD and PQRS both are in the shape of a rhombus. Find the radius of semi-circle drawn on each side of rhombus ABCD. **[3]**




OR

The adjacent angles of a parallelogram are (2x - 4)° and (3x - 1)°. Find the measures of all angles of the parallelogram.

29. Using distributive law, find the square of 101. **[3]**

30. Find the cube root of 110592 by prime factorisation method. **[3]**

31. The price of a TV is ₹13000. The sales tax charged on it is at the rate of 12%. Find the amount that Vinod will have to pay if he buys it. **[3]**

OR

Find the difference between compound interest and simple interest on ₹45000 at 12% per annum for 5yr.

32. The sides of rectangle are $3a^2 + 2b$ and $5a^2 - 4b$. Find its perimeter. **[3]**

33. The ratio of the radius and height of a cylinder is 2 : 3. If its volume is 12936 $cm^3$, find the total surface area of the cylinder. **[3]**

34. Work out the division: $9x^2y^2(3z - 24) \div 27xy(z - 8)$ **[3]**

35. The number of hours spent by a school student on various activities on a working day, is given below. Construct a pie chart using the angle measurement. **[4]**

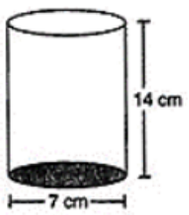
| **Activity** | **Sleep** | **School** | **Play** | **Homework** | **Others** |
|---|---|---|---|---|---|
| **Number of hours** | **8** | **6** | **3** | **3** | **4** |

36. What price should a shopkeeper mark on article that costs him ₹600 to gain 20%, after allowing a discount of 10%? **[4]**

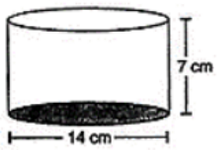
37. The adjacent sides of a rectangle are $x^2 - 4xy + 7y^2$ and $x^3 - 5xy^2$. Find the area. **[4]**

38. Diameter of cylinder A is 7 cm, and the height is 14 cm. Diameter of cylinder B is 14 cm and height is 7 cm. Without doing any calculations can you suggest whose volume is greater? Verify it by finding the volume of both the cylinders. Check whether the cylinder with greater volume also has greater surface area? **[4]**

i.




ii.




39. Factorise: $25a^2 - 4b^2 + 28bc - 49c^2$ **[4]**

OR

Factorize $x^4 - y^4$

40. Draw a graph for the radius and circumference of circle using a suitable scale. Form the graph, **[4]**

a. find the circumference of the circle when radius is 42 units.

b. at what radius will the circumference of the circle be 220 units?

# Solution

**Section A**

1.

**(c)** 1

**Explanation:** $\frac{-19}{21} \times (\frac{-21}{19})$

$= \frac{399}{399}$

= 1

2.

**(c)** 1

**Explanation:** $\frac{-17}{18} \times (\frac{-18}{17})$

$= \frac{306}{306}$

= 1

3. **(a)** $\frac{b-a}{k-m}$

**Explanation:** Given equation kx + a = mx + b

$\Rightarrow$ kx - mx = b - a [mx is transposed as - mx, a is transposed as - a]

$\Rightarrow$ x(k-m) = b - a

$\Rightarrow x = \frac{b-a}{k-m}$

4.

**(d)** 48

**Explanation:** let the number of boys and girls = x

ratio = 7 : 5

boys =7x

girls = 5x

According to question,

7x = 5x + 8

By transposing,

7x - 5x = 8

2x = 8

$x = \frac{8}{2}$

x = 4

now the number of boys = 7x = 28

the number of girls = 5x = 20

total students = 28 + 20 = 48

5.

**(d)** $144^o$

**Explanation:** Let the angles of quadrilateral be x, 2x, 3x and 4x.

According to the question,

Sum of all angles of quadrilateral = 360°

x + 2x + 3x + 4x = 360°

$\Rightarrow$ 10x = 360°

$\therefore$ x = 36°

Hence, largest angle of quadrilateral = 4 $\times$ 36°

= 144°

6.

**(d)** $10^o$, $20^o$

**Explanation:** In a parallelogram, adjacent angles are supplementary.

$\therefore 120^o + (5x + 10)^o = 180^o$

$\Rightarrow 5x + 10^o + 120^o = 180^o$

$\Rightarrow 5x = 180^o - 130^o$

$\Rightarrow 5x = 50^o$

$\Rightarrow x = 10^o$

Also, opposite angles are equal in a parallelogram.

Therefore, $6y = 120^o \Rightarrow y = 20^o$

7.

**(c)** $\frac{n(n-3)}{2}$

**Explanation:** We know that the number of diagonals in a polygon of n sides = $\frac{n(n-3)}{2}$

8.

**(b)** 1234

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

9.

**(c)** 25

**Explanation:** Prime factors of 675,

| | |
|---|---|
| 3 | 675 |
| 3 | 225 |
| 3 | 75 |
| 5 | 25 |
| 5 | 5 |
| | 1 |

$\therefore 675 = 3 \times 3 \times 3 \times 5 \times 5$

Hence, quotient, on dividing of 675 by 25 = $3 \times 3 \times 3$, it is a perfect cube number.

10. **(a)** $\frac{5}{3}$

**Explanation:** $(5)^{3x} = 5^5 \Rightarrow 3x = 5$

$\Rightarrow x = \frac{5}{3}$

11.

**(d)** Rs 17,250

**Explanation:** Price of the Washing Machine = Rs.15,000

Sale tax = ₹$\frac{15000 \times 15}{100}$

= Rs 2,250

Amount Arjun will have to pay = Rs (15,000 + 2,250)

= Rs.17,250

12.

**(b)** $3x^2 + 2xy - 5y^2$

**Explanation:** (x - y) (3x + 5y)

solving brackets we get,

x(3x + 5y) - y(3x + 5y)

$3x^2 + 5xy - 3xy - 5y^2$

$3x^2 + 2xy - 5y^2$

13. **(a)** 1 : 100

**Explanation:** Scale of map = $\frac{Size\ drawn}{Actual\ size}$

= $\frac{9\text{ cm}}{900\text{ cm}}$ (because 9 m = 900 cm)

= $\frac{1}{100}$

Thus, scale is 1 : 100.

14. **(a)** 

**Explanation:** 

15. **(a)** 162 $cm^3$

**Explanation:** Let edges of a cuboid be x, 2x and 3x, respectively.

$\therefore$ l = x, b = 2x, h = 3x

Total surface area of cuboid = 2(lb + bh + hn)

$\Rightarrow$ 198 = 2(x $\cdot$ 2x + 2x $\cdot$ 3x + 3x $\cdot$ x)

$\Rightarrow$ 99 = $2x^2 + 6x^2 + 3x^2$

$\Rightarrow$ $11x^2$ = 99

$\Rightarrow$ $x^2 = \frac{99}{1i} \Rightarrow x^2 = 9$

$\therefore$ x = 3

$\therefore$ Volume of cuboid = x $\times$ 2x $\times$ 3x

= $6x^3 = 6(3)^3$

= 6 $\times$ 27 = 162 $cm^3$

16.

**(d)** $10^6$

**Explanation:** $10^6$

17.

**(d)** -1

**Explanation:** $\frac{\left(-\frac{1}{2}\right)^5}{\left(-\frac{1}{2}\right)^4} \div \frac{\left(-\frac{1}{8}\right)}{\left(-\frac{1}{4}\right)} = \left(-\frac{1}{2}\right)^{5-4} \div \left[\left(\frac{1}{2}\right)^3 \times \left(\frac{1}{2}\right)^{-2}\right]$

= $\left(-\frac{1}{2}\right)^1 \div \left(\frac{1}{2}\right)^1$ = -1

18. **(a)** 512

**Explanation:** 512

19.

**(c)** 12.5 days

**Explanation:** This is a case of inverse proportion as with a decrease in the number of men more days will be needed to complete the work

In inverse proportion, the value of constant is given by x $\times$ y

10 $\times$ 6 $\times$ 5 = 8 $\times$ a $\times$ 3 (where a is the number of days)

$\frac{300}{24}$ = a

12.5 days = a

20.

**(d)** 60x

**Explanation:** No. of shirts Time

x $\frac{3}{4}$ min

s $\frac{3}{4}$ $\times$ 60 = 45 min

$\because$ It is direct variation

x : $\frac{3}{4}$ ::s : 45

s = $\frac{45x}{3/4}$ = 60x

**Section B**

21. LCM of 6,5 and 15 is 30

$= \frac{[25+(-12)-(-4)]}{30}$

$= \frac{[25-12+4]}{30}$

$= \frac{[29-12]}{30}$

$= \frac{17}{30}$

22. 4z + 3 = 6 + 2z

4z – 2z = 6 – 3 ... [Transposing 2z to L.H.S. and 3 to R.H.S]

∴ 2z = 3

∴ z = $\frac{3}{2}$ ... [Dividing both sides by 2]

This is the required solution.

Verification,

L.H.S = $4\left(\frac{3}{2}\right) + 3 = 6 + 3 = 9$

R.H.S = $6 + 2z = 6 + 2\left(\frac{3}{2}\right) = 6 + 3 = 9$

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

OR

Given, $\frac{3t-2}{3} + \frac{2t+3}{2} = t + \frac{7}{6}$

$\Rightarrow \quad \frac{2(3t-2)+3(2t+3)}{6} = \frac{6t+7}{6}$

$\Rightarrow$ 6t - 4 + 6t + 9 = 6t + 7

$\Rightarrow$ 12t + 5 = 6t + 7

$\Rightarrow$ 12t - 6t = 7 -5 [transposing 6t to LHS and 5 to RHS]

$\Rightarrow$ 6t = 2

$\Rightarrow \frac{6t}{6} = \frac{2}{6}$ [dividing both sides by 6]

$\therefore \quad t = \frac{1}{3}$

23. Probability $= \frac{Number\ of\ favourable\ outcomes}{Total\ number\ of\ possible\ outcomes}$

Number of favourable chance to get boys = 4

Total = 4+3 = 7

Probability $= \frac{4}{7}$

24. Let the number be x. Then, product = x $\times$ x = $x^2$

But product =51.84 [given]

therefore, $x^2$ = 51.84

$\Rightarrow x = \sqrt{51.84}$

Now, place the bar over the numbers, then square root is given below,

$\therefore x = \sqrt{51.84} = 7.2$

| | 7.2 |
|---|---|
| 7 | 51. 84 |
| | 49 |
| 142 | 284 |
| | 284 |
| | 0 |

Hence, the required number is 7.2

25. By the given graph, we have width before editing = 2 units

Width after editing = 4 units

We know that, Scale = $\frac{Size\ before\ editing}{Size\ after\ editing}$

∴ Scale = $\frac{2}{4} = \frac{1}{2}$ = 1:2

Hence, scale used to enlarge the photograph is 1 : 2.

OR

The actual length of the painting was 2 m or 2 $\times$ 100 = 200 cm [$\because$ 1 m = 100 cm]

Scale used in the painting = 1 mm : 20 cm

Hence, length of painting in photograph = Scale × Actual Size $\left[\because \text{scale} = \frac{\text{size drawn}}{\text{actual size}}\right]$

$= \frac{1}{20} \times 200$ = 10 mm

26. 16250000000 = 1625 × 10000000 = 1.625 × 1000 × 10000000 = 1.625 × $10^3$ × $10^7$ = 1.625 × $10^{10}$

27. Given, $\frac{2y-3}{4} - \frac{3y-5}{2} = y + \frac{3}{4}$

$\Rightarrow \quad \frac{2y-3-2(3y-5)}{4} = \frac{4y+3}{4}$

$\Rightarrow$ 2y - 3 - 6y + 10 = 4y + 3

$\Rightarrow$ - 4y + 7 = 4y + 3

$\Rightarrow$ - 4y - 4y = 3 - 7 [transposing 4y to LHS and 7 to RHS]

$\Rightarrow$ - 8y = - 4

$\Rightarrow \quad \frac{-8y}{-8} = \frac{-4}{-8}$ [dividing both sides by -8]

$\therefore \quad y = \frac{1}{2}$

28. In rhombus ABCD,

AO = OP + PA = 2 + 2 = 4 units and OB = OQ + QB = 2 + 1 = 3 units

We knew that, diagonals of rhombus bisect each other at 90°.

Now,

In $\Delta$OAB, $(AB)^2 = (OA)^2 + (OB)^2$ [by Pythagoras theorem]

$\Rightarrow (AB)^2 = (4)^2 + (3)^2 = 25$

$\Rightarrow$ AB = $\sqrt{25} \Rightarrow$ AB = 5 units'

Since, AS is diameter of semi-circle.

$\therefore \quad \text{radius} = \frac{\text{Diameter}}{2} = \frac{AB}{2} = \frac{5}{2}$ = 2.5 units

Hence, radius of the semi-circle is 2.5 units.

OR

Since, the adjacent angles of a parallelogram are supplementary.

$\therefore$ (2x - 4)° + (3x - 1)° = 180°

$\Rightarrow$ 5x - 5° = 180°

$\Rightarrow$ 5x = 185°

$\Rightarrow x = \frac{185^\circ}{5} \quad \Rightarrow \quad x = 37^\circ$

Thus, the adjacent angles are

x = 37°

2x - 4 = 2 × 37°- 4 = 74 - 4 = 70°

and 3x -1 = 3 × 37 °- 1 = 111 - 1 = 110°

Hence, the angles are 70°, 110°, 70°, 110°

[$\because$ opposite angles in a parallelogram are equal]

29. By using distributive law,

We have, 101 = 100 + 1

So, $101^2 = (100 + 1)^2$

= (100 + 1) (100 + 1)

= 100 (100 + 1) + 1 (100 + 1)

= ((100 × 100) + (100 × 1)) + ((1 × 100) + (1 × 1))

= 10000 + 100 + 100 + 1

= 10201

$\therefore$ The square of the given number i.e. $101^2$ = 10201

30.

| | |
|---|---|
| 2 | 110592 |
| 2 | 55296 |
| 2 | 27648 |
| 2 | 13824 |
| 2 | 6912 |
| 2 | 3456 |
| 2 | 1728 |
| 2 | 864 |
| 2 | 432 |
| 2 | 216 |
| 2 | 108 |
| 2 | 54 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

Prime factorisation of 110592 is

$2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$ [grouping the factors in triplets]

$= 2^3 \times 2^3 \times 2^3 \times 2^3 \times 3^3 = (2 \times 2 \times 2 \times 2 \times 3)^3 = 48^3$

Therefore, $\sqrt[3]{110592} = 2 \times 2 \times 2 \times 2 \times 3 = 48$ .

31. Price of TV = ₹ 13000

Sales tax charged on it = 12% of ₹ 13000

$= ₹\frac{12}{100} \times 13000$

= ₹ 1560

∴ Sale price + sales tax

= ₹ 13000 + ₹ 1560

= ₹ 14560

Hence, the amount that Vinod will have to pay if he buys it is ₹ 14560.

OR

We have,

Principal (P) = ₹45000

Rate of interest (P) = 12% per annum

Time period (T) = 5yr

Simple interest, SI = $\frac{P \times R \times T}{100}$

= $\frac{45000 \times 12 \times 5}{100}$

= 450 × 60

= ₹27000

Compound interest, Cl = A - P

where, $A = P\left(1 + \frac{R}{100}\right)^T$

∴ A = $45000\left(1 + \frac{12}{100}\right)^5$

= $45000\left(\frac{28}{25}\right)^5$

= $45000 \times \frac{28}{25} \times \frac{28}{25} \times \frac{28}{25} \times \frac{28}{25} \times \frac{28}{25}$

= $\frac{45000 \times 17210368}{9765625}$

= ₹79200

∴ Compound interest, Cl = ₹79200 - ₹45000

= ₹34200

∴ Difference between SI and Cl = ₹ 34200 - ₹27000

= ₹7200

32. Perimeter of a rectangle = 2(Sum of the sides)

= 2 [$(3a^2 + 2b) + (5a^2 - 4b)$]

= 2 [$3a^2 + 2b + 5a^2 - 4b$]

= 2 [$8a^2 - 2b$]

= $16a^2 - 4b$

33. The ratio of the radius and height of a cylinder = 2 : 3

Let the radius of the cylinder be 2x and the height of the cylinder be 3x.

Volume of the cylinder = 12936 $cm^3$

Volume of a cylinder = $\pi r^2 h$

$\therefore \quad 12936 = \frac{22}{7} \times (2x)^2 \times 3x$

$\Rightarrow \quad 12936 = \frac{22}{7} \times 4x^2 \times 3x$

$\Rightarrow \quad 12936 = \frac{264}{7} x^3$

$\Rightarrow \quad x^3 = \frac{12936 \times 7}{264} = 49 \times 7$

$\Rightarrow \quad x^3 = 7 \times 7 \times 7 = (7)^3$

$\Rightarrow x^3 = (7)^3$

$\therefore$ x = 7

So, radius = 2x = 2 $\times$ 7 = 14 cm and height = 3x = 3 $\times$ 7 = 21 cm

The total surface area of the cylinder = $2\pi r(r + h)$

= $2 \times \frac{22}{7} \times 14(14 + 21)$

= $\frac{44 \times 14}{7} \times 35 = 44 \times 14 \times 5$ = 3080 $cm^2$

34. $9x^2y^2(3z - 24) \div 27xy\,(z - 8)$

$= \frac{9x^2y^2(3z-24)}{27xy(z-8)}$

$= \frac{9x^2y^2 3(z-8)}{27xy(z-8)}$

= xy

35. Total enrolment 8 + 6 + 3 + 3 + 4 = 24

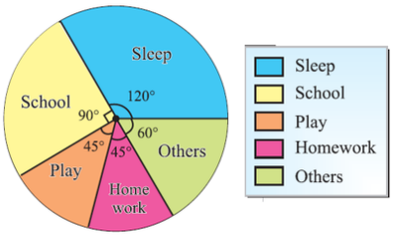
$\therefore$ Sleep $= \frac{8}{24} \times 360 = 120^\circ$

$\therefore$ School $= \frac{6}{24} \times 360 = 90^\circ$

$\therefore$ Play $= \frac{3}{24} \times 360 = 45^\circ$

$\therefore$ Homework $= \frac{3}{24} \times 360 = 45^\circ$

$\therefore$ Others $= \frac{4}{24} \times 260 = 60^\circ$




36. We have given that,

The cost price of the article = ₹ 600

Gain% = 20%

$\therefore$ Total Gain = $\frac{600 \times 20}{100}$ = ₹ 120

$\because$ SP = Gain + CP = ₹600 + ₹120 = ₹ 720

Let marked price be ₹ x.

Now shopkeeper allows a discount of 10%

According to the question, x -10% of x = ₹720

$\Rightarrow \quad x - \frac{10 \times x}{100} = 720$

$\Rightarrow \quad \frac{100x - 10x}{100} = 720$

$\Rightarrow \quad \frac{90x}{100} = 720$

$\Rightarrow \quad x = \frac{720 \times 100}{90}$

x = ₹ 800

Hence, the required marked price is ₹ 800.

37. Length = $x^2 - 4xy + 7y^2$ and Breadth = $x^3 - 5xy^2$

Area of rectangle = Length × Breadth

$= (x^2 - 4xy + 7y^2) \times (x^3 - 5xy^2)$

$= x^3 (x^2 - 4xy + 7y^2) - 5xy^2(x^2 - 4xy + 7y^2)$

$= x^5 - 4x^4y + 7x^3y^2 - 5x^3y^2 + 20x^2y^3 - 35xy^4$

$= [x^5 - 4x^4y + 2x^3y^2 + 20x^2y^3 - 35xy^4]$ sq. unit

38. The volume of cylinder B is greater.

i. For Cylinder A

$r = \frac{7}{2} cm$

h = 14 cm

$\therefore$ Volume = $\pi r^2 h$

$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 14$

= 539 $cm^3$

ii. For Cylinder B

$r = \frac{14}{2} cm = 7cm$

h = 7 cm

$\therefore$ Volume = $\pi r^2 h$

$= \frac{22}{7} \times 7 \times 7 \times 7$

= 1078 $cm^3$.

By actual calculation of volumes of both, it is verified that the volume of cylinder B is greater.

i. For Cylinder A

Surface area $= 2\pi r(r + h)$

$= 2 \times \frac{22}{7} \times \frac{7}{2} \times \left(\frac{7}{2} + 14\right)$

$= 2 \times \frac{22}{7} \times \frac{7}{2} \times \frac{35}{2}$

= 385 $cm^2$

ii. For Cylinder B

Surface area $= 2\pi r(r + h)$

$= 2 \times \frac{22}{7} \times 7 \times (7 + 7)$

$= 2 \times \frac{22}{7} \times 7 \times 14$

= 616 $cm^2$.

By actual calculation of surface area of both, we observe that the cylinder with greater volume has greater surface area.

39. $25a^2 - 4b^2 + 28bc - 49c^2$

$= 25a^2 - (4b^2 - 28bc + 49c^2)$

$= 25a^2 - \{(2b)^2 - 2(2b)(7c) + (7c)^2\}$

$= (5a)^2 - (2b - 7c)^2$. . . . [Using Identity II

$= \{5a - (2b - 7c)\} \{5a + (2b - 7c)\}$

$= (5a - 2b + 7c)(5a + 2b - 7c)$

OR

$x^4 - y^4 = (x^2)^2 - (y^2)^2$

$= (x^2 - y^2)(x^2 + y^2)$ Using $a^2 - b^2 = (a + b)(a - b)$

$= (x - y)(x + y)(x^2 + y^2)$ Using $a^2 - b^2 = (a + b)(a - b)$

40. If the radius is 7 units, then the circumference of the circle = $2 \times \pi \times 7$

$= 2 \times \frac{22}{7} \times 7 = 2 \times 22$ = 44 units [$\because$ circumference of a circles = $2\pi r$]

If radius is 14 units, then circumference = $2 \times \pi \times 14 = 28 \times \frac{22}{7}$ = 88 units units

If radius is 21 units, then circumference = $2 \times \pi \times 21 = 42 \times \frac{22}{7}$ = 132 units

If the radius is 28 units, then circumference = $2 \times \pi \times 28 = 56 \times \frac{22}{7}$ = 176 units

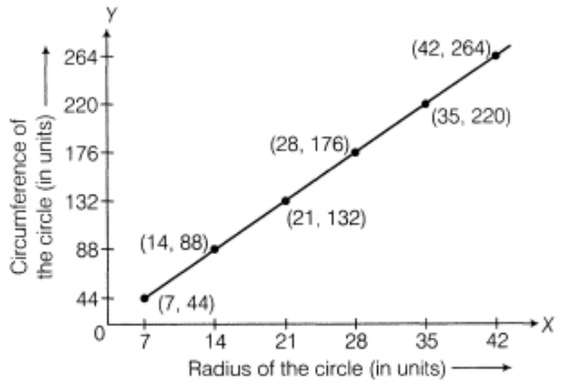
If the radius is 35 units, then circumference = $2 \times \pi \times 35 = 70 \times \frac{22}{7}$ = 220 units

If the radius is 42 units, then circumference = $2 \times \pi \times 42 = 84 \times \frac{22}{7}$ = 264 units

Now put these values in the table for the graph,

| **The radius of the circle** | 7 | 14 | 21 | 28 | 35 | 42 |
|---|---|---|---|---|---|---|
| **Circumference of the circle** | 44 | 88 | 132 | 176 | 220 | 264 |

Graph from the above data




From the graph, it is clear that:

a. The circumference of the circle will be 264 units when the radius is 42 units.

b. The radius of the circle will be 35 units when the circumference of the circle equals 220 units.