Class VIII Session 2023-24
Subject - Maths
Sample Question Paper - 4

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

Section A

1. Find: $\frac{2}{5} \times \frac{-3}{7} - \frac{1}{14} - \frac{3}{7} \times \frac{3}{5}$ **[1]**

   a) 1 b) $\frac{1}{2}$

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

2. The product of two rational numbers is always a _____. **[1]**

   a) rational number b) negative number

   c) irrational number d) None of these

3. Solve: 15(y - 4) - 2(y - 9) + 5(y + 6) = 0 **[1]**

   a) 3 b) 2

   c) $\frac{2}{3}$ d) $\frac{3}{2}$

4. Given that -0.3k + 2.1 = 0.4k, the value of k = **[1]**

   a) 21 b) 7

   c) -1 d) 3

5. A side of square is $3\sqrt{2}$ cm, then the length of its diagonal is: **[1]**

   a) $3\sqrt{2}$ cm b) 18 cm

   c) 3 cm d) 6 cm

6. A quadrilateral has three acute angles each measuring 75^o, the measure of fourth angle is **[1]**

   a) 130^o b) 125^o

   c) 135^o d) 145^o

7. What will be the number of zeroes in the square of the number 50? **[1]**

   a) 4 b) 3

   c) 2 d) 1

8. The smallest number by which 396 must be multiplied so that the product becomes a perfect square is: **[1]**

   a) 11 b) 5

   c) 2 d) 3

9. By which smallest natural number should 135 be divided so that the quotient is a perfect cube? **[1]**

   a) 2 b) 3

c) 9 d) 5

10. If the volume of a cubical box is 35.937 m^3, what is the length of its one side? **[1]**

a) 6.3 m b) 6.6 m

c) 3.3 m d) 3.6 m

11. A scooter was bought at Rs 42,000. Its value depreciated at the rate of 8% per annum. Find its value after one year. **[1]**

a) Rs 38,640 b) Rs 35,640

c) Rs 40,640 d) None of these

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

a) 35 b) $5x^2 + 25xz$

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

13. The sum of radius of the base and height of a solid cylinder is 37 m. If the total surface area of the cylinder is 1628 m^2, then find its volume. **[1]**

a) 4528 m^3 b) 4620 m^3

c) 4020 m^3 d) 2568 m^3

14. If the radius of a cylinder is tripled but its curved surface area is unchanged, then its height will be **[1]**

a) Tripled b) One third

c) One sixth d) Constant

15. If y be any non-zero integer, then y^0 is equal to **[1]**

a) 0 b) -1

c) not defined d) 1

16. If $\left(\frac{2}{5}\right)^{-4} \times \left(\frac{2}{5}\right)^{12} = \left(\frac{25}{4}\right)^{6-2x}$, then x = ? **[1]**

a) $\frac{1}{5}$ b) $\frac{-1}{5}$

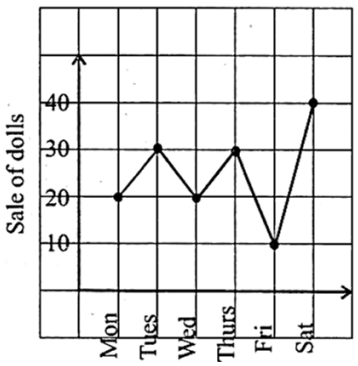
c) -5 d) 5

17. A garrison of 500 men had provision for 27 days. After 3 days a reinforcement of 300 men arrived. For how many more days will the remaining food last now? **[1]**

a) 16 b) 18

c) 15 d) $17\frac{1}{2}$

18. The line graph shows the sale of dolls by Suhas from Monday to Saturday on a particular week. Given that cost of one doll is ₹ 35, how much did Suhas receive from the sale of dolls on Saturday? **[1]**



a) ₹ 200

b) ₹ 1050

c) ₹ 700

d) ₹ 1400

19. **Assertion (A):** 1 has no multiplicative inverse. **[1]**

Reason (R): When multiplied by the given number, gives 1 as the product.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

20. **Assertion (A):** Two adjacent sides of a rectangle are equal. The name of the quadrilateral is square. **[1]**

Reason (R): A square is a quadrilateral with four right angles.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

Section B

21. The product of two rational numbers is $\frac{-14}{27}$. If one of the numbers be $\frac{7}{9}$, find the other. **[2]**

22. Find if 15625 is a perfect cube? **[2]**

23. Simplify: $\frac{(3^{-2})^2 \times (5^2)^{-3} \times (t^{-3})^2}{(3^{-2})^5 \times (5^3)^{-2} \times (t^{-4})^3}$ **[2]**

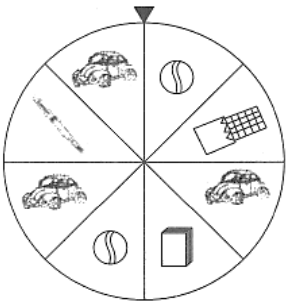
24. Mass of Mars is 6.42×10^{29} kg and mass of the Sun is 1.99×10^{30} kg. What is the total mass? **[2]**

25. Divide: 15 (y + 3) (y^2 - 16) by 5 (y^2 - y - 12) **[2]**

Section C

26. Solve the linear equation $x + 7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$ **[3]**

27. At a birthday party, the children spin a wheel to get a gift. **[3]**



Find the probability of:

a. getting a ball

b. getting a toy car

c. getting any toy except a chocolate

28. 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]**

29. The marked price of a DVD is ₹4500. A shopkeeper allows two successive discounts of 10% and 5% by the force of a customer. Find the selling price of the customer after two discounts are given. **[3]**

30. Add: 10mn, $-\frac{3}{8}mn$ and $-\frac{1}{4}mn$ **[3]**

31. A rectangular sheet of dimensions 25 cm $\times$ 7 cm is rotated about its longer side. Find the volume and the whole surface area of the solid thus generated. **[3]**

32. How many small cubes with edge of 20cm each can be just accommodated in a cubical box of 2m edge? **[3]**

33. If a and b vary inversely to each other, then find the values of p, q, r; x, y, z and l, m, n. **[3]**

a	l	9	n	6
b	5	m	25	10

Section D

34. The four angles of a quadrilateral are in the ratio 3 : 4 : 5 : 6. Find the angles. **[4]**

35. 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. **[4]**

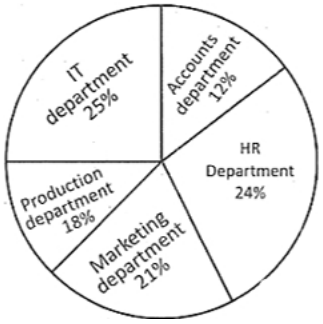
36. In a building there are 24 cylindrical pillars each having a radius of 28cm and height of 4m. Find the cost of painting the curved surface area of all the pillars at the rate of Rs.8 per m^2. **[4]**

37. Factorise the expression and divide them as directed: $(m^2 - 14m - 32) \div (m + 2)$ **[4]**

Section E

Question No. 38 to 42 are based on the given text. Read the text carefully and answer the questions: **[5]**

Read the following pie chart carefully:



Percentage of Employees in different departments of an organization = 3600

38. What is the number of employees of accounts department?

a) 362 b) 432

c) 512 d) 482

39. The ration of the number of employees of Production department to HR Department is _____.

a) 4 : 7 b) 3 : 8

c) 3 : 4 d) 7 : 12

40. If 400 new employees are hired in the marketing department, then find the ratio of number of employees of the marketing department to the number of employees in the IT department.

a) 19 : 16 b) 17 : 196

c) 17 : 15 d) 289 : 225

41. If 300 employees are shifted from HR department to production department, then new ratio of number of employees of HR department to the production department is _____.

a) 91 : 37 b) 97 : 29

c) 38 : 17 d) 28 : 59

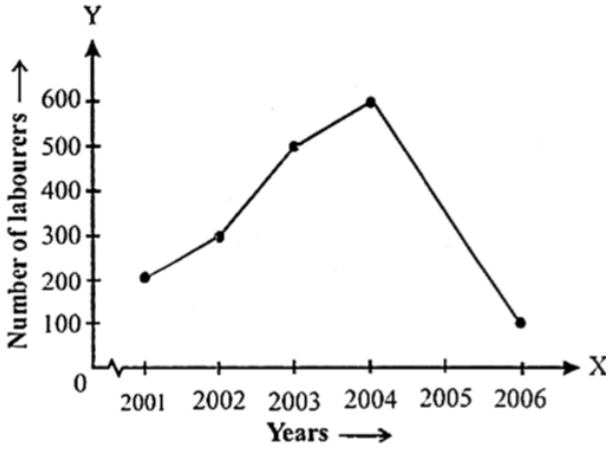
42. If 200 new employees are hired in accounts department and 100 employees of IT department left the organization, then new ratio of number of employees of IT department to accounts department is _____.

a) 79 : 100 b) 81 : 100

c) 85 : 97 d) 77 : 97

Question No. 43 to 47 are based on the given text. Read the text carefully and answer the questions: **[5]**

Read the graph:



43. In which year was the number of labourers maximum?

a) 2002 b) 2003

c) 2001 d) 2004

44. In Which year was the number of labourers minimum?

a) 2004 b) 2005

c) 2003 d) 2006

45. What was the difference of the number of labourers in the years 2002 and 2003?

a) 400 b) 200

c) 100 d) 300

46. Find the rise in the number of labourers from 2001 to 2004.

a) 500 b) 300

c) 200 d) 400

47. Find the sum of the number of labourers in the years 2004 and 2006.

a) 500 b) 200

c) 700 d) 600

Solution

Section A

1.

(c) $-\frac{1}{2}$

Explanation: $\frac{2}{5} \times \frac{-3}{7} — \frac{1}{14} — \frac{3}{7} \times \frac{3}{5}$

$= \frac{3}{7}[\frac{-2}{5} — \frac{3}{5}] — \frac{1}{14}$

$= \frac{3}{7}[\frac{-2-3}{5}] — \frac{1}{14}$

$= \frac{3}{7}[\frac{-5}{5}] — \frac{1}{14}$

$= \frac{-3}{7} — \frac{1}{14}$

$= \frac{-3\times2-1\times1}{14}$

$= \frac{-6-1}{14}$

$= \frac{-7}{14}$

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

2. **(a)** rational number

Explanation: The product of two rational numbers is always a rational number as, if we multiply any two rational numbers the product is a rational number (with the exception of 0)

3.

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

Explanation: 15(y - 4) -2(y - 9) + 5(y + 6) = 0

15y - 60 - 2y + 18 + 5y + 30 = 0

18y - 12 = 0

18y = 12

y = $\frac{12}{18}$

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

4.

(d) 3

Explanation: -0.3k + 2.1 = 0.4 k

$\Rightarrow$ 2.1 = 0.4k + 0.3k

$\Rightarrow$ 2.1 = 0.7k

$\Rightarrow$ k = $\frac{2.1}{0.7}$ = 3

5.

(d) 6 cm

Explanation: A/q

Diagonal = $\sqrt{2} \times$ side

$= \sqrt{2} \times 3\sqrt{2}$

= 6 cm

6.

(c) 135^o

Explanation: Since, $\angle A + \angle B + \angle C + \angle D$ = 360^o

$\therefore$ 75^o + 75^o + 75^o + $\angle$D

$\Rightarrow$ 225^o + $\angle$D = 360^o

$\Rightarrow$ $\angle$D = 360^o - 225^o = 135^o

7.

(c) 2

Explanation: Number of zeroes at the end of the number 50 = 1

∴ Number of zeroes at the end of the square of the number 50 = 2 × 1 = 2

8. **(a)** 11

Explanation: 396 = 2 × 2 × 3 × 3 × 11

So 396 should be multiplied by 11 to make the product a perfect square.

9. **(d)** 5

Explanation: 135 = 5 ×3 × 3 × 3

5 is left out and could not make a triplet, So, 5 is the smallest natural number by which 135 should be divided so that the quotient is a perfect cube.

10. **(c)** 3.3 m

Explanation: ∵ Volume of a cube = $(\text{side})^3$

$(\text{side})^3 = 35.937$

$\Rightarrow \text{side} = \sqrt[3]{35.937}$

$\Rightarrow \text{side} = \sqrt[3]{3.3 \times 3.3 \times 3.3}$

$\Rightarrow$ side = 3.3 m

11. **(a)** Rs 38,640

Explanation: $A = P(1 - \frac{r}{100})^n$

We applied compound Interest formula as scooter depreciated then we take minus in formula

$= ₹42000(1 - \frac{8}{100})^1$

$= ₹\frac{42000 \times 23}{25}$

= Rs 38,640

12. **(b)** $5x^2 + 25xz$

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,

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

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

$5x^2 - 0 + 25xz$

$= 5x^2 + 25xz$

13. **(b)** 4620 m^3

Explanation: Radius (r) + Height (h) = 37 m

Also, total surface area of cylinder = 2πr(r + h)

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

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

∴ Height = 37 - 7 = 30 m

So, volume of cylinder = $\pi r^2 h$

$= \frac{22}{7} \times (7)^2 \times 30 = 4620\ m^3$

14. **(b)** One third

Explanation: Let h' be the new height.

The curved surface area of a cylinder with radius r and height h = 2πrh

Now, according to the question, the radius is tripled. Then,

Curved surface area = 2 π× 3 r × h' = 2πrh

$\Rightarrow$ 6πr × h' = 2πrh

$\Rightarrow$ h' = $\frac{2\pi rh}{6\pi r}$

$\therefore$ h' = $\frac{1}{3}h$

Hence, the new hight will be $\frac{1}{3}$ of the original height.

15.

(d) 1

Explanation: Using law of exponents,

a° = 1 [for every 'a' is non-zero integer]

Similarly, y° = 1

16.

(d) 5

Explanation: $\left(\frac{2}{5}\right)^{-4} \times \left(\frac{2}{5}\right)^{12} = \left(\frac{25}{4}\right)^{6-2x}$

$\Rightarrow \left(\frac{2}{5}\right)^{12-4} = \left(\frac{4}{25}\right)^{2x-6} \Rightarrow \left(\frac{2}{5}\right)^{8} = \left(\left(\frac{2}{5}\right)^{2}\right)^{2x-6}$

$\Rightarrow \left(\frac{2}{5}\right)^{8} = \left(\frac{2}{5}\right)^{4x-12}$

On comparing, we get

4x - 12 = 8 $\Rightarrow$ 4x = 20 $\Rightarrow$ x = 5

17.

(c) 15

Explanation: Let the remaining food will last for x days.

500 men had provisions for (27 - 3) = 24 days.

(500 + 300) men had provisions for x days. More men, less days

$\therefore$ .800 : 500: : 24 : x

$\Rightarrow$ 800 $\times$ x = 500 $\times$ 24

$\Rightarrow$ x = $\frac{500\times24}{800}$ = 15

18.

(d) ₹ 1400

Explanation: Number of dolls sold on Saturday = 40

Cost of 1 doll = 35

Total cost of 35 dolls = 40 $\times$ 35 = 1400

19.

(d) A is false but R is true.

Explanation: Zero has no multiplicative inverse. So, (A) is false. The multiplicative inverse of a number is a number that, when multiplied by the given number, gives 1 as the product. (R) is true.

20.

(b) Both A and R are true but R is not the correct explanation of A.

Explanation: If two adjacent sides of a rectangle are equal then the quadrilateral is the square. So, (A) is true.

A square is a quadrilateral with four right angles is also true but it's not a correct explanation of (A).

Section B

21. It is given, one number = $\frac{7}{9}$

Let other number be x.

According to the question,

One number $\times$ Other numbers = Product of two numbers

$\frac{7x}{9} = \frac{-14}{27}$

x = $\frac{-14}{27} \times \frac{9}{7}$

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

Hence, the other number is $\frac{-2}{3}$

22.

5	15625
5	3125
5	625
5	125
5	25
5	5
	1

By prime factorisation,

15625 = 5 × 5 × 5 × 5 × 5 × 5 [grouping the factors in triplets]

= $5^3 \times 5^3$ [by laws of exponents]

= $(5 \times 5)^3$

= 25^3 which is a perfect cube.

All the terms form triplets

Therefore, 15625 is a perfect cube.

23. We have, $\frac{(3^{-2})^2 \times (5^2)^{-3} \times (t^{-3})^2}{(3^{-2})^5 \times (5^3)^{-2} \times (t^{-4})^3} = \frac{(3)^{-4} \times (5)^{-6} \times (t)^{-6}}{(3)^{-10} \times (5)^{-6} \times (t)^{-12}}$ $[\because (a^m)^n = (a)^{mn}]$

= $(3)^{-4} \times (3)^{10} \times (5)^{-6} \times (5)^6 \times (t)^{-6} \times (t)^{12}$

= $(3)^{-4+10} \times (5)^{-6+6} \times (t)^{-6+12}$ $\left[\because a^{-m} = \frac{1}{a^m}\right]$

= $(3)^6 \times 5^0 \times (t)^6 = (3t)^6$

24. Mass of Mars = 6.42×10^{29} kg

Mass of the Sun = 1.99×10^{30} kg

Total mass of Mars and Sun together = $6.42 \times 10^{29} + 1.99 \times 10^{30}$

= $6.42 \times 10^{29} + 19.9 \times 10^{29} = 26.32 \times 10^{29}$ kg

25. At first Factorising 15 (y + 3) (y^2 - 16),

we get $5 \times 3 \times (y+3)(y-4)(y+4)$

Now on factorising 5 (y^2 - y - 12), we get 5 (y^2 - 4y + 3y - 12)

= $5[y(y-4) + 3(y-4)]$

= $5 \times (y-4)(y+3)$

Therefore, on dividing the first expression by the second expression, we get $\frac{15(y+3)(y^2-16)}{5(y^2-y-12)}$

= $\frac{5 \times 3 \times (y+3)(y-4)(y+4)}{5 \times (y-4)(y+3)}$

= $3(y+4)$

Section C

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

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

$\therefore x - \frac{8x}{3} + \frac{5x}{2} = \frac{17}{6} - 7$ ... [Transposing $-\frac{5x}{2}$ to L.H.S. and 7 to R.H.S]

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

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

$\therefore x = \frac{-25}{6} \times \frac{6}{5}$ ... [Multiplying both sides by $\frac{6}{5}$]

$\therefore$ x = -5 this is the required solution.

27. a. The probability of getting a ball = $\frac{\text{Number of events of getting a ball}}{\text{Total number of events}} = \frac{2}{8} = \frac{1}{4}$

b. The probability of getting a toy car = $\frac{\text{Number of events of getting a toy car}}{\text{Total number of events}} = \frac{3}{8}$

c. The probability of getting any gift except a chocolate = $\frac{\text{Number of events of getting any gift except a chocolate}}{\text{Total number of events}} = \frac{7}{8}$

28.

6	63
	$\overline{40}\ \overline{00}$
	−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.

29. M.P. of DVD = ₹ 4500

First discount = 10% of ₹ 4500

$= \frac{10}{100} \times 4500 = ₹450$

Price after first discount = ₹ 4500 - ₹ 450= ₹ 4050

Second discount = 5% of reduced price

$= \frac{5}{100} \times Rs.4050 = \frac{20250}{100} = ₹202.50$

Net selling price of the DVD = ₹ 4050 - ₹ 202.50 = ₹3847.50.

30. $10mn + \left(-\frac{3}{8}mn\right) + \left(-\frac{1}{4}mn\right)$

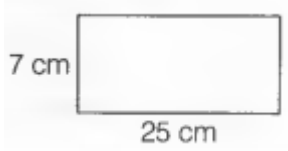
$= 10mn - \frac{3}{8}mn - \frac{1}{4}mn$

$= \left(10 - \frac{3}{8} - \frac{1}{4}\right)mn$

$= \frac{80-3-2}{8}mn$

$= \frac{75}{8}mn$

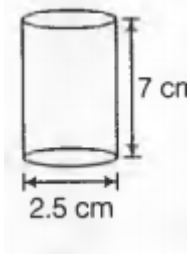
31. A rectangular sheet of dimensions 25 cm × 7 cm is rotated about its longer side which makes a cylinder with base 25 cm /and height 7 cm.



Surface area of a base = 2πr

$\therefore \quad 2\pi r = 25\text{cm}$

$\Rightarrow \quad r = \frac{25\times7}{2\times22} = \frac{175}{44}\text{cm}$



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

$= \frac{22}{7} \times \frac{175}{44} \times \frac{175}{44} \times 7$

$= \frac{175\times175}{2\times44} = \frac{30625}{88}$

= 348.011 cm^3

Surface area = $2\pi rh = 2 \times \frac{22}{7} \times \frac{175}{44} \times 7$

$= \frac{44}{44} \times 175$

= 175 cm^2

32. Cubical box = 2m = 200cm (1m=100cm)

(The units of both should be the same)

Edge of box= 20cm

Number of small cubes that can be accommodated = 200 ÷ 20 = 10 cubes

33.

a	l	9	n	6

b	5	m	25	10

If a = 6 and b = 10

Then; a × b = 6 × 10 = 60

⇒ k = 60

When a = l and b = 5, then

ab = k

⇒ l × 5 = 60 [putting the value of k]

⇒ l = 12

When a = 9 and b = m, then

ab = k

9 × m = 60 [putting the value of k]

$\Rightarrow m = \frac{20}{3}$

When a = n and b = 25, then

ab = k

⇒ n × 25 = 60 [putting the value of k]

$\Rightarrow n = \frac{60}{25}$

$\Rightarrow n = \frac{12}{5}$

Section D

34. Let angles be 3x, 4x, 5x, 6x.

Thus, 3x + 4x + 5x + 6x = 360°

since sum of the angles of a quadrilateral is 360°.

So, 18x = 360° or, x = 20°

Thus, angles are 60°, 80°, 100°, 120°.

35. 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. Since the units should be same so let's convert cm into metre as the cost is also in metres.

Radius = 28cm = 0.28m (1cm = 1/100m)

Curved surface area of pillar $= 2\pi(radius)(height)$

$= 2 \times \frac{22}{7} \times 0.28 \times 4$

$= 44 \times \frac{16}{100}$

= 7.04m^2

Curved surface area of 24 pillars $= 7.04 \times 24$

= 168.96m^2

Cost of curved surface area of one m^2 = Rs.8

Cost of curved surface area of 168.96m2 pillar $= Rs.8 \times 168.96$

= Rs. 1351.68

Therefore, the costs of painting 24 cylindrical pillars are Rs.1351.68.

37. (m^2 – 14m – 32) ÷ (m + 2)

$= \frac{m^2-14m-32}{m+2}$

$= \frac{m^2-16m+2m-32}{m+2}$. . . . [Using Identity IV

$= \frac{m(m-16)+2(m-16)}{m+2}$

$= \frac{m(m-16)(m+2)}{m+2}$

= m – 16

Section E

38. **(b)** 432
Explanation: 432

39. **(c)** 3 : 4
Explanation: 3 : 4

40. **(d)** 289 : 225
Explanation: 289 : 225

41. **(b)** 97 : 29
Explanation: 97 : 29

42. **(a)** 79 : 100
Explanation: 79 : 100

43. **(d)** 2004
Explanation: 2004 $\rightarrow$ 500

44. **(d)** 2006
Explanation: 2006 $\rightarrow$ 100

45. **(b)** 200
Explanation: No. of the labourers 2002 = 300
Number of the labourers 2003 = 500
Difference of the number of labourers in year 2002 and 2003 = 500 - 300 = 200

46. **(d)** 400
Explanation: Number of the labourers 2001 = 200
Number of labourers in 2004 = 600
Rise in the labourers from 2001 to 2004 = 600 - 200 = 400

47. **(c)** 700
Explanation: Number of labourers in 2004 = 600
Number of labourers in 2006 = 100
Sum of the number of labourers in 2004 and 2006 600 + 100 = 700