

Class VIII Session 2025-26

Subject - Mathematics

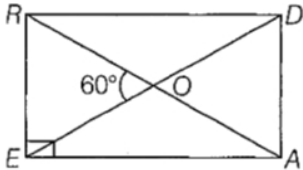
Sample Question Paper - 3

Time Allowed: 3 hours

Maximum Marks: 80

Section A

1. Find $\frac{3}{7} + \left(-\frac{6}{11}\right) + \left(-\frac{8}{21}\right) + \frac{5}{22}$ [1]
 - a) $\frac{-125}{462}$
 - b) 125
 - c) 462
 - d) -125
2. The value of x for which the expressions $3x - 4$ and $2x + 1$ become equal is [1]
 - a) 1
 - b) -3
 - c) 0
 - d) 5
3. In rectangle READ, the values of $\angle EAR$, $\angle RAD$ and $\angle ROD$ are respectively [1]



 - a) $40^\circ, 60^\circ, 110^\circ$
 - b) $30^\circ, 40^\circ, 110^\circ$
 - c) $30^\circ, 60^\circ, 120^\circ$
 - d) $30^\circ, 40^\circ, 120^\circ$
4. The probability of getting not more than 7 in rolling of a dice is [1]
 - a) $\frac{1}{4}$
 - b) $\frac{1}{7}$
 - c) $\frac{1}{2}$
 - d) 1
5. By which smallest natural number should 128 be divided so that the quotient is a perfect cube? [1]
 - a) 2
 - b) 3
 - c) 6
 - d) 4
6. A TV set was bought for ₹26250 including 5% VAT. The original price of the TV set is [1]
 - a) ₹27562.50
 - b) ₹26245
 - c) ₹28000
 - d) ₹25000
7. The sum of $-7pq$ and $2pq$ is: [1]
 - a) $5pq$
 - b) $-5pq$
 - c) $9pq$
 - d) $-9pq$
8. Simplify: $\left[\left\{ \left(\frac{-1}{5} \right)^{-2} \right\}^2 \right]^{-1}$ [1]

a) $\frac{5}{625}$

b) $\frac{1}{625}$

c) $\frac{1}{652}$

d) $\frac{-1}{625}$

9. A train can finish a journey in 10 hours, travelling at a speed of 56 km/h. If another faster train is to cover the same journey in 8 hours, what would be the average speed of the new train? [1]

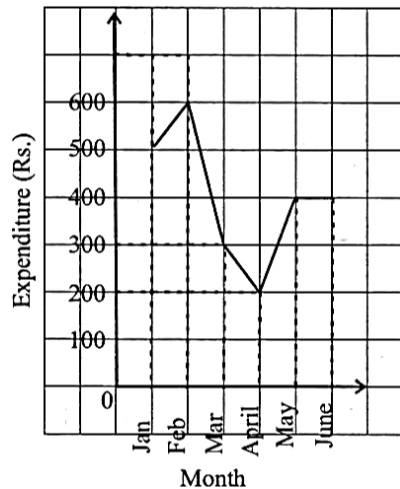
a) 60 km/h

b) 80 km/h

c) 50 km/h

d) 70 km/h

10. The line graph shows the monthly expenditure of the the Vasu family. The difference between their highest and lowest monthly expenditure is: [1]



a) ₹ 300

b) ₹ 400

c) ₹ 100

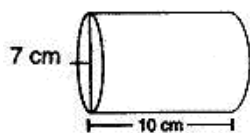
d) ₹ 200

Section B

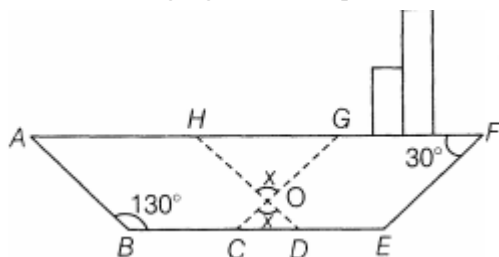
11. Fill in the blanks: [10]
- Product of two rational numbers is a _____. [1]
 - If $\frac{2}{5}x - 2 = 5 - \frac{3}{5}x$, then $x =$ _____. [1]
 - The name of three-sided regular polygon is _____. [1]
 - An experiment whose outcomes cannot be predicted exactly in advance is called a _____ experiment. [1]
 - The unit's digit of the square of a number having digit at unit's place as 4 or 6 is _____. [1]
 - Amount (A) = Principal + _____ [1]
 - 0.000003 is equal to _____ $\times 10^{-6}$. [1]
 - If $xy = 10$, then x and y vary _____ with each other. [1]
 - The number of terms in the expression $xyz + 1$ is _____. [1]
 - The graph of a linear equation is always a _____ line. [1]

Section C

- Tell which property allows you to compare $\frac{2}{3} \times \left[\frac{3}{4} \times \frac{5}{7} \right]$ and $\left[\frac{2}{3} \times \frac{5}{7} \right] \times \frac{3}{4}$ [2]
- The number 1057 is obviously not perfect square. Give reason. [2]
- Is 46656 a perfect cube? [2]
- Subtract $4a - 7ab + 3b + 12$ from $12a - 9ab + 5b - 3$. [2]
- Find the volume of the following cylinder: [2]



17. Find the common factors of the given term: $3x^2y^3$, $10x^3y^2$, $6x^2y^2z$ [2]
18. Solve: $\frac{1}{2}(x+1) + \frac{1}{3}(x-1) = \frac{5}{12}(x-2)$ [3]
19. In the following figure of a ship, ABDH and CEFG are two parallelograms. Find the value of x . [3]



20. 2025 plants are to be planted in a garden in such a way that each row contains as many plants as the number of rows. Find the number of rows and the number of plants in each row. [3]
21. A man gives 40% of his money to his children and 20% of the remaining to a trust. If he is still left with ₹ 9600, what is the amount did he originally have? [3]
22. What must be added to $2m^2 - 3mn + 3n^2$ to get $5m^2 + 2mn + 7n^2$? [3]
23. Find the total surface area of a cuboid with dimensions 8 cm by 6 cm by 5 cm. [3]
24. Compare the numbers 2.7×10^{12} and 1.5×10^8 [3]
25. Two persons could fit new windows in a house in 3 days. How many persons would be needed to fit the windows in one day? [3]
26. In a district, the number of branches of different banks is given below: [4]

Bank	State Bank of India	Bank of Baroda	Punjab National Bank	Canara Bank
Number of branches	30	17	15	10

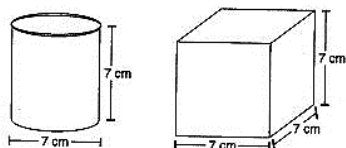
Draw a pie chart for this data.

27. 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%

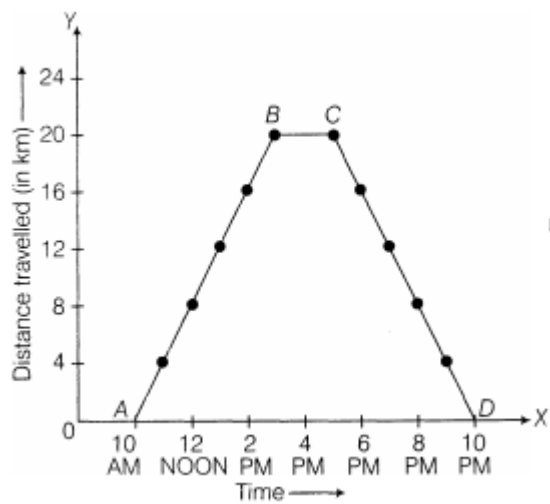
Find the total amount of the bill she has to pay.

28. The adjacent sides of a rectangle are $x^2 - 4xy + 7y^2$ and $x^3 - 5xy^2$. Find the area. [4]
29. Describe how the two figures at the right are alike and how they are different. Which box has larger lateral surface area? [4]



30. Factorize $x^4 - y^4$ [4]
31. Study the graph given below of a person who started from his home and returned at the end of the day. Answer the questions that follow. [4]





- At what time did the person start from his home?
- How much distance did he travel in the first four hours of his journey?
- What was he doing from 3 PM to 5 PM?
- What was the total distance travelled by him throughout the day?
- Calculate the distance covered by him in the first 8 hours of his journey.
- At what time did he cover 16 km of his journey?
- Calculate the average speed of the man from A to B and B to C.
- At what time did he return home?

Solution

Section A

1. (a) $\frac{-125}{462}$

Explanation:

$$\begin{aligned} & \frac{3}{7} + \left(-\frac{6}{11}\right) + \left(-\frac{8}{21}\right) + \frac{5}{22} \\ &= \left[\left(\frac{3}{7}\right) + \left(-\frac{8}{21}\right)\right] + \left[\left(-\frac{6}{11}\right) + \frac{5}{22}\right] \\ &= \left[\frac{3 \times 3 - 1 \times 8}{21}\right] + \left[\frac{-6 \times 2 + 1 \times 5}{22}\right] \\ &= \left[\frac{9-8}{21}\right] + \left[\frac{-12+5}{22}\right] \\ &= \frac{1}{21} - \frac{7}{22} \\ &= \left[\frac{1 \times 22 - 7 \times 21}{462}\right] \\ &= \left[\frac{22-147}{462}\right] \\ &= \frac{-125}{462} \end{aligned}$$

2.

(d) 5

Explanation:

When the value of x is 5 then both the expressions will be equal.

Proof

$$3x - 4 = 2x + 1$$

$$x = 5$$

3.

(c) 30° , 60° , 120°

Explanation:

Given, a rectangle READ, in which

$$\angle ROE = 60^\circ$$

$$\therefore \angle EOA = 180^\circ - 60^\circ = 120^\circ \text{ [linear pair]}$$

$$\text{Now, in } \triangle EOA, \angle OEA = \angle OAE = 30^\circ$$

[\because OE = OA and equal sides make equal angles]

$$\therefore \angle EAR = 30^\circ, \angle RAD = 90^\circ - \angle EAR = 60^\circ$$

$$\text{and } \angle ROD = \angle EOA = 120^\circ$$

4.

(d) 1

Explanation:

$$1$$

5. (a) 2

Explanation:

$$128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

one 2 is left out and could not make a triplet, so 2 is the smallest natural number by which 128 should be divided so that the quotient is a perfect cube.

6.

(d) ₹25000

Explanation:



The cost price of TV set = ₹26250.

VAT including = 5%

$$\therefore \text{Original price} = 26250 \times \frac{100}{105}$$

$$= ₹ 25000$$

Hence, ₹25000 is correct.

7.

(b) -5 pq

Explanation:

Given, monomials are -7pq and 2pq.

\therefore Their sum = -7pq + 2pq = (-7 + 2) pq [both monomials consist of like terms, so adding their numerical coefficient]

$$= -5 \text{ pq}$$

8.

(b) $\frac{1}{625}$

Explanation:

Given expression can be written as

$$\left[\left(\frac{-1}{5} \right)^{-2} \right]^{2 \times (-1)} \quad [\text{using } (x^m)^n = x^{m \times n}]$$

$$\Rightarrow \left[\left(\frac{-1}{5} \right)^{-2} \right]^{-2} = \left(\frac{-1}{5} \right)^{(-2) \times (-2)}$$

$$= \left(\frac{-1}{5} \right)^4$$

$$= \frac{(-1)^4}{(5)^4} \quad [\text{using } \left(\frac{a}{b} \right)^n = \frac{a^n}{b^n}] = \frac{1}{625}$$

9.

(d) 70 km/h

Explanation:

Speed and time are inversely related so with a decrease in time duration the speed has to increase to complete the journey.

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

$$10 \times 56 = 8 \times a \quad (\text{where } a \text{ is the average speed of the train})$$

$$\frac{560}{8} = a$$

$$70 \text{ km / hr} = a$$

10.

(b) ₹ 400

Explanation:

Month with highest expenditure = February

Month with lowest expenditure = April

$$\text{Difference in expenditure} = 600 - 200 = 400$$

Section B

11. Fill in the blanks:

(i) 1. Rational number

(ii) 1. 7

(iii) 1. triangle

(iv) 1. Random

(v) 1. 6

(vi) 1. Interest

(vii) 1. 3

(viii) 1. Inversely

(ix) 1.2

(x) 1. Straight

Section C

12. $\frac{2}{3} \times \left[\frac{3}{4} \times \frac{5}{7} \right] = \frac{2}{3} \times \left(\frac{5}{7} \times \frac{3}{4} \right)$ [by commutative property over multiplication]
 $= \left(\frac{2}{3} \times \frac{5}{7} \right) \times \frac{3}{4}$ [by associative property over multiplication]

Hence, $\frac{2}{3} \times \left(\frac{3}{4} \times \frac{5}{7} \right)$ can be compared with $\left(\frac{2}{3} \times \frac{5}{7} \right) \times \frac{3}{4}$ with the help of associative and commutative property.

13. 1057. The number 1057 is not a perfect square because it ends with 7 whereas the square numbers end with 0, 1, 4, 5, 6 or 9.

14.
$$\begin{array}{r|l} 2 & 46656 \\ \hline 2 & 23328 \\ \hline 2 & 11664 \\ \hline 2 & 5832 \\ \hline 2 & 2916 \\ \hline 2 & 1458 \\ \hline 3 & 729 \\ \hline 3 & 243 \\ \hline 3 & 81 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

By prime factorisation,

$46656 = \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{2} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{3}$ [grouping the factors in triplets]

$= 2^3 \times 2^3 \times 3^3 \times 3^3$

$= 36^3$ which is a perfect cube.

All the terms form triplets

Therefore, 46656 is a perfect cube.

15.
$$\begin{array}{r} 12a - 9ab + 5b - 3 \\ - 4a - 7ab + 3b + 12 \\ \hline - \quad + \quad - \quad - \\ 8a - 2ab + 2b - 15 \end{array}$$

16. $d = 7 \text{ cm}$, $r = \frac{7}{2} \text{ cm}$, $h = 10 \text{ cm}$

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

$= \pi \left(\frac{7}{2} \right)^2 \times 10$

$= \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} \times 10$

$= 11 \times 7 \times 5$

$= 385 \text{ cm}^3$

17. $3x^2y^3 = 3 \times x \times x \times y \times y \times y$

$10x^3y^2 = 2 \times 5 \times x \times x \times x \times y \times y$

$6x^2y^2z = 2 \times 3 \times x \times x \times y \times y \times z$

Hence the common factors are x, x, y, y

and $x \times x \times y \times y = x^2y^2$

18. Given, $\frac{1}{2}(x+1) + \frac{1}{3}(x-1) = \frac{5}{12}(x-2)$

$\Rightarrow \frac{x}{2} + \frac{1}{2} + \frac{x}{3} - \frac{1}{3} = \frac{5x}{12} - \frac{5}{6}$

$\Rightarrow \frac{x}{2} + \frac{x}{3} - \frac{5x}{12} = \frac{1}{3} - \frac{1}{2} - \frac{5}{6}$ [transposing $\frac{1}{2}$, $\frac{1}{3}$ to RHS and $\frac{5x}{12}$ to LHS]

$\Rightarrow \frac{6x+4x-5x}{12} = \frac{2-3-5}{6}$

$\Rightarrow \frac{5x}{12} = \frac{-6}{6}$



$$\Rightarrow 5x \times 6 = (-6) \times 12 \text{ [by cross-multiplication]}$$

$$\Rightarrow x = \frac{(-6) \times 12}{5 \times 6}$$

$$\therefore x = \frac{-12}{5}$$

19. We have, two parallelograms ABDH and CEFG.

Now, in ABDH,

$\therefore \angle ABD = \angle AHD = 130^\circ$ [\because opposite angles of a parallelogram are equal]

and $\angle GHD = 180^\circ - \angle AHD = 180^\circ - 130^\circ$ [linear pair]

$$\Rightarrow 50^\circ = \angle GHO$$

Also, $\angle EFG + \angle FGC = 180^\circ$ [\because adjacent angles of a parallelogram are supplementary]

$$\Rightarrow 30^\circ + \angle FGC = 180^\circ \Rightarrow \angle FGC = 180^\circ - 30^\circ = 150^\circ$$

and $\angle HGC + \angle FGC = 180^\circ$ [linear pair]

$$\therefore \angle HGC = 180^\circ - \angle FGC = 180^\circ - 150^\circ = 30^\circ = \angle HGO$$

In $\triangle HGO$, by using angle sum property, $\angle OHG + \angle HGO + \angle HOG = 180^\circ$

$$\Rightarrow 50^\circ + 30^\circ + x = 180^\circ \Rightarrow x = 180^\circ - 80^\circ = 100^\circ$$

20. Let the number of rows be x.

Then number of plants in each row = x

\therefore Number of plants in x rows = $x \times x = x^2$

But 2025 plants are to be planted in a garden.

$$\therefore x^2 = 2025$$

$$\therefore x = \sqrt{2025}$$

The prime factorisation of 2025 is

$$\begin{array}{r|l} 3 & 2025 \\ \hline 3 & 675 \\ \hline 3 & 225 \\ \hline 3 & 75 \\ \hline 5 & 25 \\ \hline & 5 \end{array}$$

$$2025 = \underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{5} \times \underline{5}$$

$$\therefore x = \sqrt{\underline{3} \times \underline{3} \times \underline{3} \times \underline{3} \times \underline{5} \times \underline{5}}$$

$$\therefore x = 3 \times 3 \times 5$$

$$\therefore x = 45$$

Hence, the number of rows is 45 and the number of plants in each row is 45.

21. Let the original amount of money with him = ₹ 100

Money given to children = 40% of original money

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

Remaining money = ₹ 100 - ₹ 40 = ₹ 60

Money given to trust = 20% of the remaining money

$$= \frac{20}{100} \times 60 = ₹ 12$$

Left over money = ₹ 60 - 12 = ₹ 48

But, given left over money = ₹ 9600

When left over money is Rs. 48, original money = ₹ 100

If leftover money is Rs.9600, the original money = $\frac{9600 \times 100}{48} = ₹ 20,000$.

22. 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 $3m^2 + 5mn + 4n^2$.

23. Here l = 8 cm, w = 6 cm, h = 5 cm

$$TSA = 2(lw + wh + hl)$$

$$= 2(8 \times 6 + 6 \times 5 + 5 \times 8)$$

$$= 2(48 + 30 + 40)$$

$$= 2(118) = 236$$

So, the total surface area is 236 cm^2

$$24. 2.7 \times 10^{12} = 2.7 \times (10 \times 10^{11}) = (2.7 \times 10) \times 10^{11} = 27 \times 10^{11}$$

$$1.5 \times 10^8 = 1.5 \times (10 \times 10^7) = (1.5 \times 10) \times 10^7 = 15 \times 10^7$$

Now, $27 > 15$ and

$$10^{11} > 10^7$$

Therefore, $27 \times 10^{11} > 15 \times 10^7$

Hence, $2.7 \times 10^{12} > 1.5 \times 10^8$

25. Let x persons be needed

We have the following table.

Number of days	3	1
Number of persons	2	x

Clearly, more the number of persons, faster would they do the job. So, the number of persons and number of days vary in inverse proportion.

$$\text{So, } 3 \times 2 = 1 \times x$$

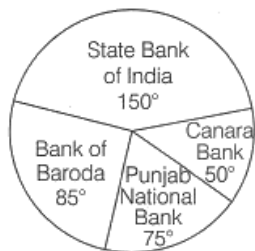
$$\therefore x = 6$$

Thus, 6 persons would be needed.

26. Total number of branches = $30 + 17 + 15 + 10 = 72$

Bank	Number of branches	Central angle
State Bank of India	30	$\frac{30}{72} \times 360^\circ = 150^\circ$
Bank of Baroda	17	$\frac{17}{72} \times 360^\circ = 85^\circ$
Punjab National Bank	15	$\frac{15}{72} \times 360^\circ = 75^\circ$
Canara Bank	10	$\frac{10}{72} \times 360^\circ = 50^\circ$

The pie chart is as follows:



27. From the given data in the table,

Rate of one packet of atta = ₹200

Discount % = 16%

$$\text{So, price after discount} = 200 - \frac{16}{100} \times 200$$

$$= 200 - 32$$

$$= ₹168$$

Rate of one packet of detergent = ₹371

Discount % = 22.10%

$$\text{So, price after discount} = 371 - 371 \times \frac{22.10}{100}$$

$$= 371 - 81.991$$

$$= ₹289.009$$

Rate of one packet of namkeen = 153

Discount % = 18.30%

$$\text{So, price after discount} = 153 - 153 \times \frac{18.30}{100}$$

$$= 153 - 27.999$$

$$= ₹125.001$$

$$\therefore \text{Total bill amount to be paid} = ₹168 + ₹289.009 + ₹125.001 \\ = ₹582.01$$

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

Area of rectangle = Length \times Breadth

$$= (x^2 - 4xy + 7y^2) \times (x^3 - 5xy^2) \\ = x^3(x^2 - 4xy + 7y^2) - 5xy^2(x^2 - 4xy + 7y^2) \\ = x^5 - 4x^4y + 7x^3y^2 - 5x^3y^2 + 20x^2y^3 - 35xy^4 \\ = [x^5 - 4x^4y + 2x^3y^2 + 20x^2y^3 - 35xy^4] \text{ sq. unit}$$

29. Similarity \rightarrow Both have same height.

Difference \rightarrow One is a cylinder, the other is a cube.

For the first figure

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

$$h = 7 \text{ cm}$$

$$\therefore \text{Lateral surface area} = 2\pi rh$$

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

$$= 154 \text{ cm}^2$$

For second figure

$$l = 7 \text{ cm}$$

$$b = 7 \text{ cm}$$

$$h = 7 \text{ cm}$$

$$\therefore \text{Lateral surface area} = 4l^2$$

$$= 4 \times (7)^2$$

$$= 196 \text{ cm}^2$$

Hence, the second box has the larger lateral surface area.

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

$$= (x^2 - y^2)(x^2 + y^2) \text{ Using } a^2 - b^2 = (a + b)(a - b)$$

$$= (x - y)(x + y)(x^2 + y^2) \text{ Using } a^2 - b^2 = (a + b)(a - b)$$

31. After observing the graph carefully, it is clear that

a. At 10 AM, the person starts from his home.

b. In the first 4 h (i.e. till 2 PM), he travelled 16 km.

c. The person was taking rest from 3 PM to 5 PM.

d. The total distance covered by the person throughout the day was 40 km, i.e. 20 km from A to B and then 20 km from C to D.

e. The distance covered by him in the first 8 h i.e. from 10 AM to 6 PM was 24 km.

f. He covered 16 km of his journey at 2 PM.

g. The total distance covered from A to B = 20 km and the time taken to travel from A to B = 5 h

$$\therefore \text{The average speed of the man from A to B} = \frac{20}{5} = 4 \text{ km/h}$$

$$\text{and average speed from B to C} = \frac{0}{2} = 0 \text{ km/h}$$

h. He returned home at 10 PM.

