


**STUDY**  
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**Sample Paper**  
(2018-19)

Date : \_\_\_\_\_

Duration : 3 Hrs.

Max. Marks : 80

**Mathematics**

**Class**

**VIII**

**Instructions:**

- ▶ Attempt any 8 out of given 10 sections as per prescribed syllabus.
- ▶ In each Section Q. No. 1 is of 1 mark.
- ▶ In each Section Q. No. 2 is of 2 marks.
- ▶ In each Section Q. No. 3 is of 3 marks.
- ▶ In each Section Q. No. 4 is of 4 marks.

**Section A – Squares and Square Roots and Cubes and Cube Roots**

1. Find the one's digit of the cube of 5022.
2. Find the square root of 4096 by prime factorisation method.
3. Rahul makes a cuboid of plasticine of sides 5 cm, 2 cm and 5 cm. How many such cuboids will he need to form a cube?
4. Find the smallest number by which 768 should be multiplied so as to get a perfect square number. Also, find the square root of the square number so obtained.

**Section B – Exponents and Powers**

1. Express 4050000 in standard form.
2. Find the value of  $\left(\frac{1}{3}\right)^3 \times \left(\frac{3}{2}\right)^2$ .
3. Find 'm' so that  $(-3)^{m+1} \times (-3)^5 = (-3)^7$ .
4. Simplify :

(i)  $\left(\frac{5}{8}\right)^{-7} \times \left(\frac{8}{5}\right)^{-5}$  .

(ii)  $\left\{ \left(\frac{1}{3}\right)^{-2} - \left(\frac{1}{2}\right)^{-3} \right\} \div \left(\frac{1}{4}\right)^{-2}$  .

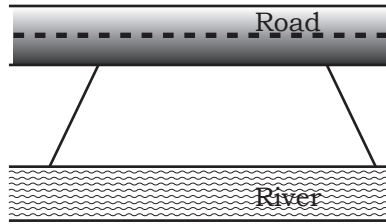
**Section C – Linear Equations in One Variable**

1. Solve :  $3x - 2 = 7$
2. Solve for  $x$  :  $8x - 11 - 5x + 3 = 2x + 4 - 3x$ .
3. Simplify and solve :  $15(y - 4) - 2(y - 9) + 5(y + 6) = 0$
4. I have a total of ₹300 in coins of denomination ₹1, ₹2 and ₹5. The number of ₹2 coins is 3 times the number of ₹5 coins. The total number of coins is 160. How many coins of each denomination are with me?

**Section D – Mensuration**

1. If the side of the square is 60 m. Find its area.
2. Find the total surface area of a cube whose edge is 15 m.

3. Mohan wants to buy a trapezium shaped field. Its side along the river is parallel to and twice the side along the road. If the area of this field is  $10500 \text{ m}^2$  and the perpendicular distance between the two parallel sides is  $100 \text{ m}$ , find the length of the side along the river.



4. A road roller takes 750 complete revolutions to move once over to level a road. Find the area of the road if the diameter of a road roller is  $84 \text{ cm}$  and length is  $1 \text{ m}$ .

### Section E – Algebraic Expressions and Identities

1. Add :  $ab - bc, bc - ca, ca - ab$ .
2. Evaluate :  $(998)^2$ .
3. Simplify  $3x(4x - 5) + 3$  and find its values for (i)  $x=3$  and (ii)  $x = \frac{1}{2}$
4. (i) Show that :  $(3x + 7)^2 - 84x = (3x - 7)^2$   
(ii) Find the product using suitable identity :  $(7a - 9b)(7a - 9b)$ .

### Section F – Factorisation

1. Find the common factor of the given terms:  $12x, 36$ .
2. Simplify :  $\frac{25x^3y^2}{-15x^2y}$ .
3. Factorise the expression and divide as directed :  $(y^2 + 7y + 10) \div (y + 5)$ .
4. Factorise :  
(i)  $p^2 + 6p + 8$  (ii)  $49x^2 - 36$ .

### Section G – Direct and Inverse Proportions

1. If  $x$  and  $y$  vary directly, which of the following is not true?  
(a) If  $x$  increases  $y$  also increases  
(b) If  $x$  decreases  $y$  also decreases  
(c) If  $x$  decreases  $y$  increases
2. 'a' and 'b' vary directly. If  $a_1 = 20, b_1 = 8$  and  $a_2 = 10$ , find  $b_2$ .
3. An electric pole,  $14 \text{ metres}$  high, casts a shadow of  $10 \text{ metres}$ . Find the height of a tree that casts a shadow of  $15 \text{ metres}$  under similar conditions.
4. A farmer has enough food to feed  $20$  animals in his cattle for  $6$  days. How long would the food last if there were  $10$  more animals in his cattle?

### Section H – Comparing Quantities

1. Find  $23\%$  of  $200$ .
2. An article was sold at  $\text{₹}2727$  at a loss of  $10\%$ . Find its C.P.
3. Calculate the amount and compound interest on  $\text{₹}8000$  for  $1$  year at  $9\%$  per annum compounded half yearly.
4. The list price/marked price of a frock is  $\text{₹}220$ . A discount of  $20\%$  is announced on sales. What is the amount of discount on it and its sale price?

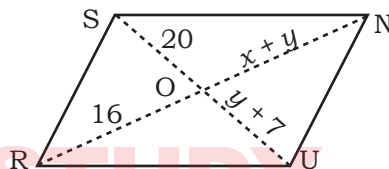
### Section I – Introduction to Graphs

1. State whether True or False: A point whose  $y$  coordinate is zero and  $x$ -coordinate is 5 will lie on  $y$ -axis.
2. State the quadrants in which the following points lie:
  - (i)  $A(3, 5)$
  - (ii)  $B(-4, -7)$
  - (iii)  $C(5, -1)$
  - (iv)  $D(-4, 10)$
3. Draw the line passing through  $(2, 3)$  and  $(3, 2)$ . Find the coordinates of the points at which this line meets the  $x$ -axis and  $y$ -axis.
4. Draw the graph for the following table of values :

<b>Number of apples</b>	1	2	3	4	5
<b>Cost (in ₹)</b>	5	10	15	20	25

### Section J – Practical Geometry and Understanding Quadrilaterals

1. Write the formula of sum of interior angles of a polygon.
2. Find the number of sides of a regular polygon whose each exterior angle has a measure of  $45^\circ$ .
3. RUNS is a parallelogram. Find the value of  $x$  and  $y$ .



4. Construct the following quadrilateral :

- PLAN  
 PL = 4 cm  
 LA = 6.5 cm  
 $\angle P = 90^\circ$   
 $\angle A = 110^\circ$   
 $\angle N = 85^\circ$

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**Hints/Solutions to Sample Paper**  
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**[Section - A (Squares and Square Roots and Cubes and Cube Roots)]**

1. 8.

2. 
$$\begin{array}{r} 2 \overline{)4096} \\ \underline{2048} \\ 2 \overline{)1024} \\ \underline{512} \\ 2 \overline{)256} \\ \underline{128} \\ 2 \overline{)64} \\ 2 \overline{)32} \\ 2 \overline{)16} \\ 2 \overline{)8} \\ 2 \overline{)4} \\ 2 \overline{)2} \\ 1 \end{array}$$

$4096 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$\sqrt{4096} = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$\sqrt{4096} = 64.$

3.  $5 \times 2 \times 2 = 20$  such cuboids are needed.

4. 
$$\begin{array}{r} 2 \overline{)768} \\ \underline{384} \\ 2 \overline{)192} \\ \underline{96} \\ 2 \overline{)48} \\ \underline{24} \\ 2 \overline{)12} \\ \underline{6} \\ 3 \overline{)3} \\ 1 \end{array}$$

$768 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3$

$\therefore$  Prime factor 3 does not occur in a pair

$\therefore$  768 must be multiplied by 3 to make it a perfect square.

$768 \times 3 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3$

$\sqrt{2304} = 2^2 \times 2^2 \times 2^2 \times 2^2 \times 3^2$

$\sqrt{2304} = 48.$

**[Section - B (Exponents and Powers)]**

1.  $4050000 = 4.05 \times 10^6$

2. 
$$\left(\frac{1}{3}\right)^3 \times \left(\frac{3}{2}\right)^2$$

$$\frac{1}{27} \times \frac{9}{4}$$

$$\frac{1}{12}$$

3.  $(-3)^{m+1} \times (-3)^5 = (-3)^7$

$(-3)^{m+1+5} = (-3)^7$  ( $a^m \times a^n = a^{m+n}$ )

$(-3)^{m+6} = (-3)^7$

$m + 6 = 7$  (when bases are same powers will be equal)

$m = 1.$

4. (i) 
$$\left(\frac{5}{8}\right)^{-7} \times \left(\frac{8}{5}\right)^{-5}$$

$$\left(\frac{5}{8}\right)^{-7} \times \left(\frac{5}{8}\right)^5 \quad \left\{ \left(\frac{a}{b}\right)^{-m} = \left(\frac{b}{a}\right)^m \right\}$$

$$\left(\frac{5}{8}\right)^{-7+5} \quad (a^m \times a^n = a^{m+n})$$

$$\left(\frac{5}{8}\right)^{-2}$$

$$\left(\frac{8}{5}\right)^2 \quad \left\{ \left(\frac{a}{b}\right)^{-m} = \left(\frac{b}{a}\right)^m \right\}$$

$$\frac{64}{25}$$

$$(ii) \quad \left\{ \left(\frac{1}{3}\right)^{-2} - \left(\frac{1}{2}\right)^{-3} \right\} \div \left(\frac{1}{4}\right)^{-2}$$

$$(3^2 - 2^3) \div (4)^2 \quad \left\{ \left(\frac{a}{b}\right)^{-m} = \left(\frac{b}{a}\right)^m \right\}$$

$$(9 - 8) \div 16$$

$$\frac{1}{16}$$

### Section -C (Linear Equations in One Variable)

1.  $x = 3$

2.  $x = 3$


3.  $15(y - 4) - 2(y - 9) + 5(y + 6) = 0$

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

$$18y - 12 \quad \Rightarrow \quad = 0$$

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

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

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4. Total number of coins = 160

Let the number of ₹5 coins be  $x$

Number of ₹2 coins is  $3x$

Number of ₹1 coins =  $160 - (x + 3x) = 160 - 4x$

Amount = ₹300

$$1 \times (160 - 4x) + 2 \times 3x + 5 \times x = 300$$

$$160 - 4x + 6x + 5x = 300$$

$$7x + 160 = 300$$

$$7x = 300 - 160$$

$$7x = 140$$

$$x = 20$$

So, the number of ₹1 coins =  $160 - 4 \times 20 = 80$

Number of ₹2 coins =  $3 \times 20 = 60$

Number of ₹5 coins = 20

### Section - D (Mensuration)

1. Area =  $(60)^2 = 3600 \text{ m}^2$

2. TSA =  $6 \times \text{edge}^2$

$$= 6 \times (15)^2$$

$$= 6 \times 225$$

$$= 1350 \text{ m}^2$$

3. Let the length of the side along the road be  $x$  meters

Then the length of the side along the river is  $2x$  meters.

Perpendicular distance,  $h = 100$  m

Area of trapezium =  $10500 \text{ m}^2$

$$\frac{1}{2} \times \text{sum of parallel sides} \times h = \frac{1}{2} \times (x + 2x) \times 100 = 10500$$

$$\frac{1}{2} \times 3x \times 100 = 10500$$

$$x = \frac{10500 \times 2}{3 \times 100}$$

$$x = 70$$

So, the length of the side along the river is  $2 \times 70 = 140$  m

4. Diameter =  $84$  cm

Radius,  $r = 42$  cm

Length,  $h = 100$  m

Area covered in 1 revolution = CSA of cylinder =  $2\pi rh$

$$= 2 \times \frac{22}{7} \times 42 \times 100$$

$$= 26400 \text{ cm}^2$$

$$\text{Area covered in 750 revolutions} = 750 \times 26400 = 19800000 \text{ cm}^2$$

$$= 1980 \text{ m}^2$$

So, the area of the road is  $1980 \text{ m}^2$ .

### Section -E(Algebraic Expressions and Identities)

1.  $ab - bc + bc - ca + ca - ab = 0$

2.  $(998)^2 = (1000 - 2)^2$   
 $= (1000)^2 - 2 \times 2 \times 1000 + (2)^2$   
 $= 1000000 - 4000 + 4$   
 $= 996004.$

3.  $3x(4x - 5) + 3$   
 $12x^2 - 15x + 3$

When  $x = 3$

$$= 12(3)^2 - 15(3) + 3$$

$$= 108 - 45 + 3$$

$$= 66$$

When  $x = \frac{1}{2}$

$$\Rightarrow 12\left(\frac{1}{2}\right)^2 - 15\left(\frac{1}{2}\right) + 3$$

$$= 12 \times \frac{1}{4} - \frac{15}{2} + 3$$

$$= 3 - \frac{15}{2} + 3$$

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

4. LHS :

(i)  $(3x + 7)^2 - 84x$

$$(3x)^2 + 2 \times 3x \times 7 + (7)^2 - 84x$$

$$9x^2 + 42x + 49 - 84x$$

$$9x^2 - 42x + 49$$

RHS :

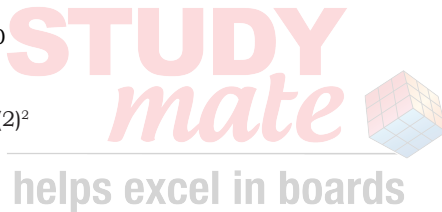
$$(3x - 7)^2$$

$$(3x)^2 - 2 \times 3x \times 7 + (7)^2$$

$$9x^2 - 42x + 49$$

$$\text{LHS} = \text{RHS}$$

(ii)  $(7a - 9b)(7a - 9b)$



$$\begin{aligned}(7a - 9b)^2 &= (7a)^2 - 2 \times 7a \times 9b + (9b)^2 \\ &= 49a^2 - 126ab + 81b^2\end{aligned}$$

## Section -F(Factorisation)

1.  $12x = 2 \times 2 \times 3 \times x$   
 $36 = 2 \times 2 \times 3 \times 3$   
 common factor =  $2 \times 2 \times 3$   
 $= 12$

2.  $\frac{25x^3y^2}{-15x^2y}$   
 $\frac{-5xy}{3}$

3.  $\frac{y^2 + 7y + 10}{y + 5}$   
 $= \frac{(y + 5)(y + 2)}{(y + 5)}$   
 $= (y + 2)$

4. (i)  $p^2 + 6p + 8$   
 $(p + 4)(p + 2)$   
 (ii)  $49x^2 - 36$   
 $(7x + 6)(7x - 6)$

## Section -G(Direct and Inverse Proportions)

1. (c)

2.  $\frac{a_1}{b_1} = \frac{a_2}{b_2}$   
 $\frac{20}{8} = \frac{10}{b_2}$   
 $b_2 = \frac{8 \times 10}{20}$

$$b_2 = 4.$$

3. Let the height of the pole be  $x$   
 Let the length of the shadow be  $y$

Height (m)	14	$x_2$
Length of the shadow (m)	10	15

$\therefore$  It is the case of direct variation

$$\therefore \frac{x_1}{y_1} = \frac{x_2}{y_2}$$

$$\frac{14}{10} = \frac{x_2}{15}$$

$$\Rightarrow x_2 = \frac{14 \times 15}{10} = 21$$

So, the height of the tree is 21 m.

4. Let the number of animals be  $x$   
 and Let the number of days be  $y$

No. of animals	20	$20 + 10 = 30$
No. of days	6	$y_2$

$\therefore$  It is the case of Inverse variation

$$\therefore x_1 \times y_1 = x_2 \times y_2$$

$$20 \times 6 = 30 \times y_2$$

$$\Rightarrow y_2 = \frac{20 \times 6}{30}$$

$$y_2 = 4.$$

So, the food would last for 4 days.

### Section -H(Comparing Quantities)

1.  $\frac{23}{100} \times 200 = 46$

2. Let the C.P. be ₹x

$$\text{Loss\%} = 10\%$$

$$\text{Loss} = \frac{\text{Loss\%}}{100} \times \text{C.P.}$$

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

$$\text{Loss} = ₹ \frac{x}{10}$$

$$\text{C.P} - \text{Loss} = \text{S.P.}$$

$$x - \frac{x}{10} = 2727$$

$$\frac{9x}{10} = 2727$$

$$x = \frac{27270}{9}$$

$$x = 3030$$

So, the C.P. of the article is ₹ 3030

3. P = ₹ 8000

R = 9% p.a.

T = 1 year

compounded half yearly

$$R = \frac{9}{2}\% \text{ per half year}$$

T = 2 half years

$$A = P \left[ 1 + \frac{R}{100} \right]^T$$

$$= 8000 \left[ 1 + \frac{9}{200} \right]^2$$

$$= 8000 \times \frac{209}{200} \times \frac{209}{200}$$

$$A = ₹8736.20$$

$$\text{C.I.} = A - P$$

$$= 8736.20 - 8000$$

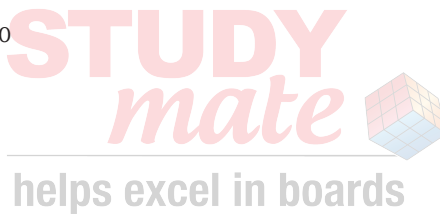
$$= ₹736.20$$

4. M.P. = ₹220

Discount % = 20%

$$\text{Discount} = \frac{20}{100} \times 220 = ₹44$$

$$\text{S.P.} = \text{M.P.} - \text{Discount} = ₹(220 - 44) = ₹176$$



### Section -I(Introduction to Graphs)

1. False

2. (i) I

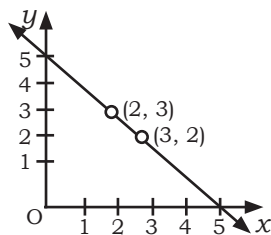
(ii) III

(iii) IV

(iv) II

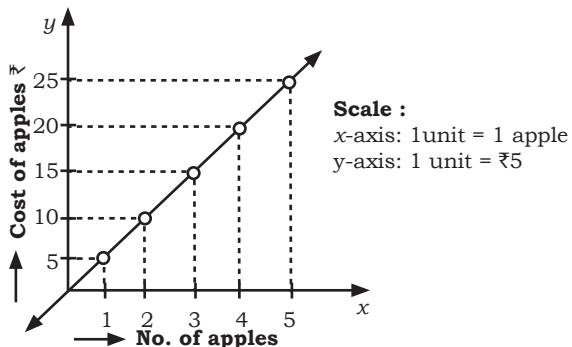


3.



This line meets  $x$ -axis at  $(5,0)$  and  $y$ -axis at  $(0, 5)$

4.



[Section -J (Practical Geometry and Understanding Quadrilaterals)]

1. Sum of interior angles of a polygon with  $n$  sides =  $(n - 2) \times 180^\circ$ .

2. In a regular polygon,

No of sides = no. of angles =  $n$

sum of all the exterior angles =  $360^\circ$

$$n \times 45^\circ = 360^\circ$$

$$n = \frac{360^\circ}{45^\circ}$$

$$n = 8.$$

So, the polygon has 8 sides.

3. Since the diagonals of a parallelogram bisect each other

$$\therefore OU = OS$$

$$y + 7 = 20$$

$$y = 13$$

$$\& x + y = 16$$

$$x + 13 = 16$$

$$x = 3.$$

