

ICSE Board
Class IX Mathematics
Sample Paper – 1

Time: 2½ hrs

Total Marks: 80

General Instructions:

1. Answers to this paper must be written on the paper provided separately.
 2. You will NOT be allowed to write during the first 15 minutes. This time is to be spent in reading the question paper.
 3. The time given at the head of this paper is the time allowed for writing the answers.
 4. This question paper is divided into two Sections.
Attempt all questions from Section A and any four questions from Section B.
 5. Intended marks for questions or parts of questions are given in brackets along the questions.
 6. All working, including rough work, must be clearly shown and should be done on the same sheet as the rest of the answer. Omission of essential working will result in loss of marks.
 7. Mathematical tables are provided.
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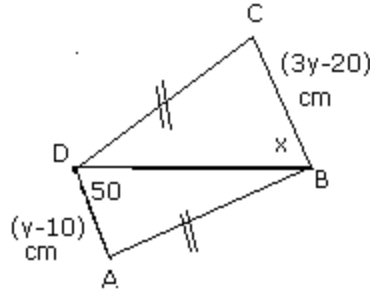
Section - A (40 Marks)

Q. 1.

- (a) The compound interest on a certain sum of money at 5% p.a. for 2 years is Rs. 287.
Find the sum. [3]
- (b) Show that $\sqrt{2}$ is an irrational number. [3]
- (c) A sold a table to B at 25% profit and B sold it to C for Rs. 96, making a profit of 20%.
Find the price at which A purchased the table. [4]

Q. 2.

- (a) Use congruency of triangles to find the value of x and y. [3]



- (b) Express: $2\log 3 - \frac{1}{2}\log 16 + \log 12$, as a single logarithm. [3]

- (c) Construct $\triangle ABC$ in which the base, $BC = 4.5$ cm, $m\angle B = 60^\circ$ and the sum of other two sides is 8 cm. [4]

Q. 3.

- (a) Evaluate: [3]

$$\left(\frac{8}{27}\right)^{-2/3} - \left(\frac{1}{3}\right)^{-2} - (7)^0$$

- (b) Make p as the subject of the formula: [3]

$$r = \sqrt{\frac{a(p-a)}{q}}$$

- (c) Find the area of a square in which the sum of one diagonal and two sides is equal to $6\sqrt{2}$ cm. [4]

Q. 4.

- (a) Using Pythagoras theorem, prove that the area of an equilateral triangle of side 'a' is $\frac{\sqrt{3}}{4} \times a^2$. [3]

- (b) The difference between the exterior angle of a regular polygon of n sides and a regular polygon of (n + 2) sides is 6. Find the number of sides. [4]

- (c) Evaluate :

$$\frac{4}{\tan^2 60^\circ} + \frac{1}{\cos^2 30^\circ} - \tan^2 45^\circ$$
 [3]

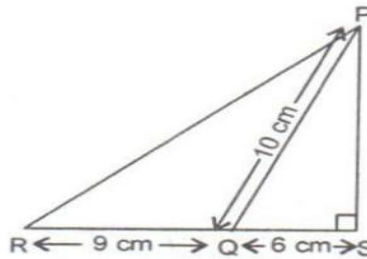
Section - B (40 marks)

Q. 5.

- (a) Graphically solve the following equations: [4]
 $3x - 5y + 1 = 0$; $2x - y + 3 = 0$ [Use 1 cm = 1 unit on both the axes]
- (b) A man starts his job with a certain monthly salary and earns a fixed increment every year. If his salary was Rs. 1500 after 4 years of service and Rs. 1800 after 10 years of his service, what was his starting salary and what is the annual increment? [3]
- (c) If $x = \frac{1}{\sqrt{2}-1}$, then prove that $x^2 - 6 + \frac{1}{x^2} = 0$ [3]

Q. 6.

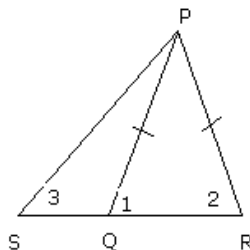
- (a) What sum of money will amount to Rs. 3630 in two years at 10% p.a. compound interest? [3]
- (b) In the given figure, $m\angle PSR = 90^\circ$, $PQ = 10$ cm, $QS = 6$ cm, $RQ = 9$ cm. Calculate the length of PR. [3]



- (c) An article is bought for Rs. 124. What should be the marked up selling price so that there is a profit of 10% even after allowing a discount of 12%? [4]

Q. 7.

- (a) Calculate the mean and median of the following data: [3]
 3, 1, 5, 6, 3, 4, 5, 3, 7, 2
- (b) A room is 8 m long and 5 m broad. Find the cost of covering the floor of the room with 80 cm wide carpet at the rate of Rs. 22.50 per metre. [3]
- (c) In the figure, Q is a point on side of ΔPSR such that $PQ = PR$. Prove that $PS > PQ$. [4]

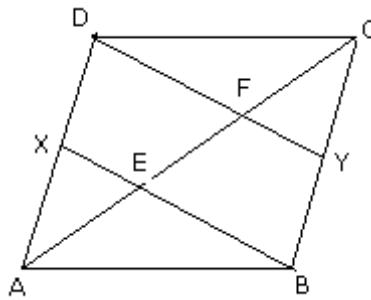


Q. 8.

- (a) The total surface area of a solid cylinder is 462 cm^2 and its curved surface area is $\frac{1}{3}$ rd of its total surface area. Find the volume of the cylinder. [4]
- (b) The altitudes BQ and CP of $\triangle ABC$ meet at O. Prove that: [6]
- $CQ \times OP = BP \times OQ$
 - $\triangle POQ \sim \triangle BOC$

Q. 9.

- (a) In $\triangle ABC$, $m\angle A = 90^\circ$ and $AD \perp BC$, D being the foot of the perpendicular. Prove that $AD^2 = BD \cdot DC$ [3]
- (b) If $p^{\frac{1}{x}} = p^{\frac{1}{y}} = p^{\frac{1}{z}}$ and $pqr = 1$, prove that $x + y + z = 0$ [3]
- (c) In the given figure, ABCD is a parallelogram in which X and Y are the midpoints of AD and BC respectively, Prove that: $AE = EF = FC$. [4]



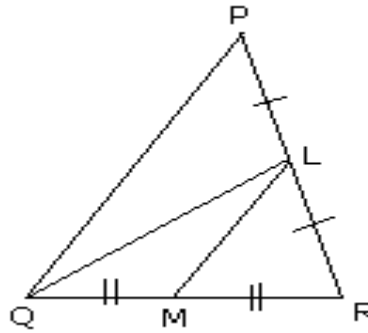
Q. 10.

- (a) Solve the equation: [3]
- $$\frac{7x - 1}{4} - \frac{1}{3} \left(2x + \frac{x - 1}{2} \right) = 6\frac{1}{3}$$
- (b) Given $3 \cos A - 4 \sin A = 0$; evaluate without using tables: $\frac{\sin A + 2 \cos A}{3 \cos A - \sin A}$ [4]
- (c) If $a + \frac{1}{a} = 4$, find the value of: [3]
- $a^2 + \frac{1}{a^2}$
 - $a^4 + \frac{1}{a^4}$

Q. 11.

(a) Show that a median divides a triangle into two triangles of equal areas. [4]

(b) In the given figure, area of $\Delta PQR = 44.8 \text{ cm}^2$, $PL = LR$ and $QM = MR$. Find the area of ΔLMR . [3]



(c) Factorize: $x^3 - 3x^2 - x + 3$ [3]