

ICSE Board
Class IX Mathematics
Sample Paper – 8

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.

Section - A (40 Marks)

Attempt **all** questions from this section.

Q. 1.

- (a) Find three rational numbers lying between $\frac{3}{5}$ and $\frac{7}{8}$.

How many rational numbers can be determined between these two numbers?

[3]

- (b) Factorise: $12ky^2 + 8ky - 20k$

[3]

- (c) The area of a rectangle is 192 cm^2 and its perimeter is 56 cm . Find the dimensions of the rectangle.

[4]

Q. 2.

- (a) On a certain sum of money lent out at CI, the interest for the first, second and third years are Rs. 1,500, Rs. 1,725 and Rs. 2,070, respectively. Find the rate of interest for the (i) second year and (ii) third year.

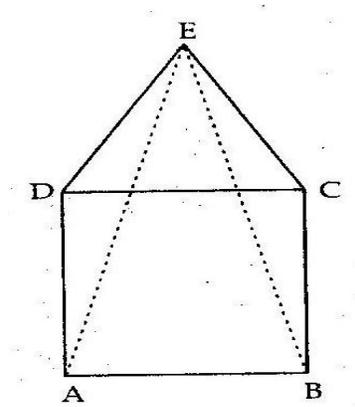
[3]

- (b) Simplify the following:

[3]

$$\left(\frac{64a^{12}}{27b^6}\right)^{-\frac{2}{3}}$$

- (c) In the adjoining figure, ABCD is a square and $\triangle EDC$ is an equilateral triangle.
Prove that [4]
(i) $AE = BE$, (ii) $\angle DAE = 15^\circ$



Q. 3.

- (a) Solve the following pairs of simultaneous equations. [3]

$$\frac{3}{5}x - \frac{2}{3}y + 1 = 0$$

$$\frac{1}{3}y + \frac{2}{5}x = 4$$

- (b) A man starts his job with a certain monthly salary and a fixed increment every year. If his monthly salary will be Rs. 11,000 after 2 years and Rs. 14,000 after 4 years of his service, what is his starting salary and what is the annual increment? [3]

- (c) Solve: [4]
- (i) Find the class mark of the class 90–120.
 - (ii) In a frequency distribution, the mid-value of the class is 10 and the width of the class is 6. Find the lower limit of the class.
 - (iii) The width of each of five continuous classes in a frequency distribution is 5 and the lower class limit of the lowest class is 10. What is the upper class limit of the highest class?
 - (iv) The class marks of a frequency distribution are 15, 20, 25. Find the class corresponding to the class mark 20.
 - (v) In the class intervals 10–20 and 20–30, find the class in which 20 is included.

Q. 4.

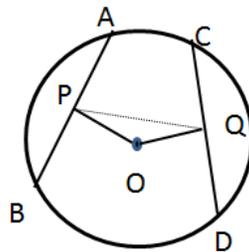
(a) Express the following in terms of $\log 2$ and $\log 3$. [3]

$$\log \frac{225}{16} - 2 \log \frac{5}{9} + \log \left(\frac{2}{3} \right)^5$$

(b) Simplify: [3]

$$(x + y - z)^2 + (x - y + z)^2$$

(c) In the given figure, AB and CD are two equal chords of a circle with centre O. If P is the mid-point of chord AB, Q is the mid-point of chord CD and $\angle POQ = 150^\circ$, find $\angle APQ$. [4]



Section - B (40 marks)

Attempt any **four** questions from this section.

Q. 5.

(a) Find the equation of the line that has x-intercept = -3 and is perpendicular to $3x + 5y = 1$. [3]

(b) ABCD is a trapezium with AB parallel to DC. A line parallel to AC intersects AB at X and BC at Y. Prove that area of $\triangle ADX =$ area of $\triangle ACY$. [3]

(c) Mohit borrowed a certain sum at 5% per annum compound interest and cleared this loan by paying Rs. 12,600 at the end of the first year and Rs. 17,640 at the end of the second year. Find the sum borrowed. [4]

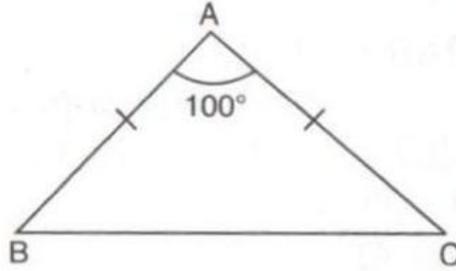
Q. 6.

(a) Construct a regular hexagon of side 3.2 cm. [3]

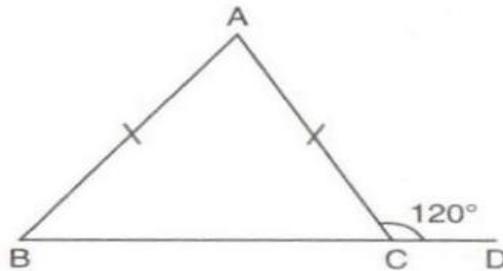
(b) Solve for x, $\log_x^{15\sqrt{5}} = 2 - \log_x^{3\sqrt{5}}$. [3]

(c) Find the interior angles of the following triangles. [4]

(i)



(ii)



Q. 7.

(a) In $\triangle ABC$, $\angle B = 90^\circ$, $AB = 40$, $AC + BC = 80$. Find: [3]

(i) $\sin A$

(iii) $\cos A$

(iv) $\tan C$

(b) Evaluate:
$$\frac{2^n \times 6^{m+1} \times 10^{m-n} \times 15^{m+n-2}}{4^m \times 3^{2m+n} \times 25^{m-1}}$$
 [3]

(c) ABCD is a parallelogram. E is the mid-point of CD and P is a point on AC such that

[4] $PC = \frac{1}{4} AC$. EP produced meets BC at F. Prove that

(i) F is the mid-point of BC

(ii) $2EF = BD$

Q. 8.

(a) D is a point on the side of BC of $\triangle ABC$. Prove that the perimeter of $\triangle ABC$ is greater than twice of AD. [3]

(b) The sum of a two-digit number and the number obtained by reversing the order of the digits is 99. Find the number if the digits differ by 3. [3]

(c) Find the median of the data.

46, 41, 77, 58, 35, 64, 87, 92, 33, 55, 90

In the above data, if 41 and 55 are replaced by 61 and 75, respectively, what will be the new median? [4]

Q. 9.

(a) A matchbox measures 4 cm \times 2.5 cm \times 1.5 cm. What is the volume of a packet containing 12 such matchboxes? [3]

(b) In a circle with centre O, diameters AD and BC are given. Prove that chord AB = chord CD. [3]

(c) Solve the following simultaneous equations using the graphical method:
 $3x + 4y + 5 = 0$; $y = x + 4$ [4]

Q. 10

(a) Prove that the bisector of the vertex angle of an isosceles triangle bisects the base perpendicularly. [3]

(b) Evaluate: $\frac{\log_5^8}{\log_{25}^{16} \times \log_{100}^{10}}$ [3]

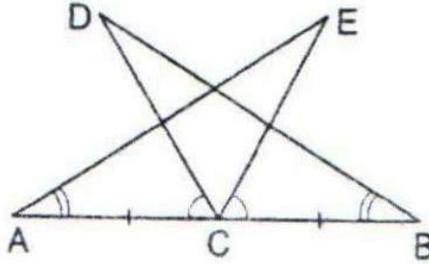
(c) In $\triangle ABC$; $\angle B = 90^\circ$; find the values of [4]

(i) $\sin A \cos C + \cos A \sin C$

(iii) $\cos A \cos C - \sin A \sin C$

Q. 11.

- (a) In the given figure, C is the mid-point of AB. If $\angle DCA = \angle ECB$ and $\angle DBC = \angle EAC$, prove that $DC = EC$. [3]



- (b) The diagonals of a rectangle intersect each other at right angles. Prove that the rectangle is a square. [3]
- (c) The perimeter of a triangle is 450 m and its side are in the ratio 12:5:13. Find the area of the triangle. [4]