

ICSE Board
Class X Mathematics
Sample Paper – 10

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)

*(Answer **all questions** from this Section)*

Q. 1.

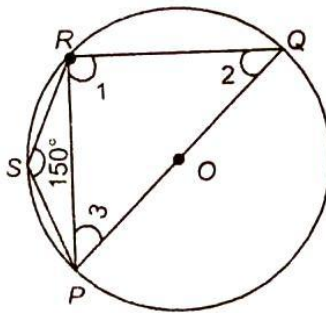
- (a) The list price of a T.V is Rs. 12, 000. The shopkeeper offers a 5% discount on the list price. A further off-season discount of 2% is given. If he charges sales tax at 10% find the price one has to pay for the T.V. [3]

(b) Solve for x : $\frac{1+x+x^2}{1-x+x^2} = \frac{62(1+x)}{63(1-x)}$ [3]

- (c) Padma invested Rs. 30,000 in a finance company and received Rs. 39,930 after $1\frac{1}{2}$ years. Find the rate of interest per annum compound semi-annually. [4]

Q. 2.

- (a) Check whether the polynomial $q(t) = 4t^3 + 4t^2 - t - 1$ is a multiple of $2t + 1$. [3]
- (b) If the mean of 6, 4, 7, p and 10 is 8. Find the value of p . [3]
- (c) In the given fig. POQ is the diameter and $PQRS$ is a cyclic quadrilateral. If $m\angle PSR = 150^\circ$. Find $m\angle RPQ$. [4]



Q. 3.

- (a) Mr. Jain has a R.D account of Rs. 250 per month for a period of 1 year at the rate of 10% p.a. Find the amount he will receive at the time of maturity. [3]
- (b) A horse is placed for grazing inside a rectangular field 70 m by 52 m and is tethered to one corner by a rope 21 m long. Find the area available for grazing. [3]
- (c) The points $A(2, 1)$, $B(0, 3)$ and $C(-3, -2)$ are the vertices of a triangle. [4]
- Plot the points on a graph paper.
 - Draw the triangle formed by reflecting these points on the x-axis.
 - Are the two triangles congruent?

Q. 4.

- (a) Without using tables, evaluate $\frac{\cos^2 20^\circ + \cos^2 70^\circ}{\sin^2 59^\circ + \sin^2 31^\circ}$. [3]
- (b) Solve $\frac{4-2y}{3} \geq \frac{y}{2} - 3$, and represents the solution on the number line if $y \in \mathbb{R}$. [3]
- (c) Calculate the mean wage for the following data: [4]

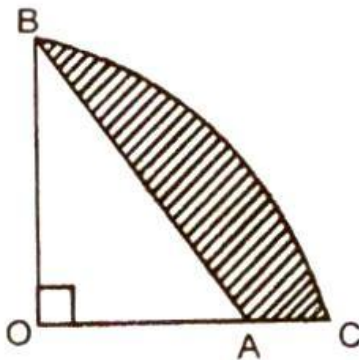
Wage (in Rs.)	800	820	860	900	920	980	1000
No. of Workers	7	14	19	25	20	10	5

Section B (40 Marks)

(Answer **any four questions** from this Section)

Q. 5

- (a) In the figure, find the area of the shaded region if OBCA is a quadrant of a circle. $OB = OC = 7$ cm and $OA = 5$ cm (use $\pi = 22/7$) [3]

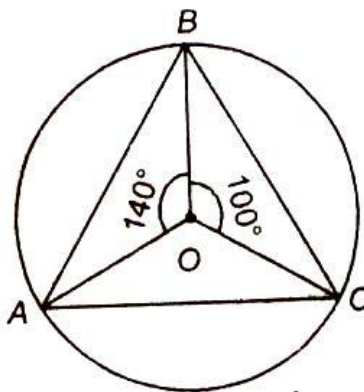


- (b) Prove that : $\frac{1}{1-\sin\theta} + \frac{1}{1+\sin\theta} = 2 \sec^2 \theta$ [3]

- (c) ABCD is a quadrilateral in which $AB = BC$. The right bisectors of AD and CD meet at a point P. Prove that PB bisects $\angle ABC$. [4]

Q. 6.

- (a) In the given fig. $\triangle ABC$ is inscribed in a circle with centre O. If $m\angle AOB = 140^\circ$ and $m\angle BOC = 100^\circ$, find $\angle ABC$. [3]



- (b) Without using the Pythagoras theorem, show that $(4, 4)$, $(3, 5)$ and $(-1, -1)$ are the vertices of a right angled triangle. [3]

- (c) If $A = \begin{bmatrix} 4 & 1 \\ -1 & 2 \end{bmatrix}$, show that $6A - A^2 = 9I$, where I is the unit matrix. [4]

Q. 7.

- (a) A man in a boat rowing away from a light house 100 m high, takes 2 minutes to change the angle of elevation of the top of the light house from 60° to 45° . Show that the speed of the boat is $50 \left(\frac{3 - \sqrt{3}}{3} \right)$ m/min. [4]
- (b) Prove that the ratio of the areas of similar triangles is equal to the ratio of the squares on their corresponding sides.
Using these results, find the length of EF, if $\triangle ABC \sim \triangle DEF$ such that the area of $\triangle ABC$ is 9 cm^2 and the area of $\triangle DEF = 16 \text{ cm}^2$ and $BC = 2.1 \text{ cm}$. [6]

Q. 8.

- (a) AB is the diameter and AC is a chord such that $m\angle BAC = 30^\circ$, if the tangent at C intersects AB produced in D, prove that $BC = BD$. [3]
- (b) If two adjacent vertices of a parallelogram are $(3, 2)$ and $(-1, 0)$ and the diagonals intersect at $(2, -5)$ find the other vertices of the parallelogram. [3]
- (c) A man sold Rs. 100 shares at 10% discount and invested in 15% Rs. 50 shares at Rs. 33. Had he sold his shares at 10% premium instead of 10% discount, he would have earned Rs. 450 more. Find the number of shares sold by him. [4]

Q. 9.

- (a) A die is rolled once. Find the probability of getting
(i) a prime number
(ii) not an even number
(iii) a factor of 4 [3]
- (b) Solve the equation $x^2 - 4x - 1 = 0$ and write the answer corrected up to three decimal places. [3]
- (c) The area of the base of a right circular cone is 28.26 sq. cm . If its height is 4 cm, find its volume and the curved surface area. (use $\pi = 3.14$) [4]

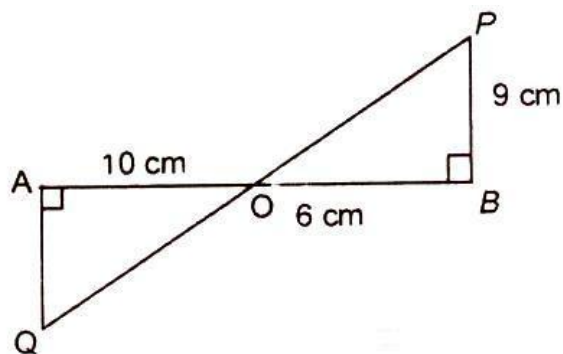
Q. 10.

(a) In a school the weekly pocket money of 50 students is as follows:

Weekly pocket money in Rs.	40-50	50-60	60-70	70-80	80-90	90-100
No. of Students	2	8	12	14	8	6

Draw a histogram and a frequency polygon on the same graph. Find the mode from the graph. [6]

(b) In the given fig. QA and PB are perpendicular to AB. If $AO = 10$ cm, $BO = 6$ cm and $PB = 9$ cm, find AQ. [4]



Q. 11.

(a) Find the equation of a line joining the points $(3, -1)$ and $(2, 3)$. Also find the equation of the line perpendicular to this line and passing through the point $(5, 2)$. [3]

(b) Construct $\angle ABC = 45^\circ$. Mark a point P on BC such that $BP = 5.5$ cm. Construct a circle which touches AB at B and also passes through P. [3]

(c) If I walk 1 km per hour faster than I normally walk, I would have taken 10 minutes less to walk 2 km. Find the rate of my walking. [4]