

ICSE Board
Class X Mathematics

Time: 2½ hrs

Total Marks: 80

SECTION – A
[Answer all the Questions]

Question I.

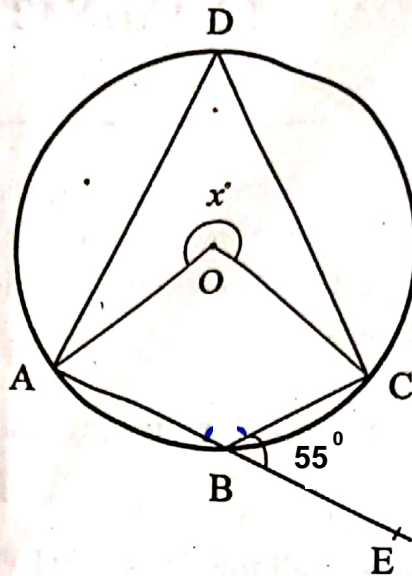
1. Prove that $\frac{\sec A - \tan A}{\sec A + \tan A} = 1 + 2\tan^2 A - 2 \sec A \cdot \tan A$ [3]
2. Find the 8th term from the end of G.P. 3, 6, 12, 24, ..., ..., 6144 [3]
3. Find the set of values of P for which the equation $px^2 - 5x + p = 0$ has real and equal roots. [4]

Question II.

1. The median of the following observation 11, 12, 14, (x - 2), (x + 4), (x + 9), 32, 38, 47 arranged in ascending order is 24. Find the value of x and thus the numbers [3]
2. If $3 \begin{bmatrix} 2 & x \\ 1 & 0 \end{bmatrix} + 2 \begin{bmatrix} 4 & 3 \\ y & 2 \end{bmatrix} = \begin{bmatrix} z & -3 \\ 15 & 4 \end{bmatrix}$ find x, y and z. [3]
3. A can do a piece of work in x days and B can do it in (x + 16) days, if both working together can do it in 15 days, calculate x. [4]

Question III.

1. A cylindrical vessel of radius 4cm contains water, A solid sphere of radius 3cm is lowered into the water until it is completely immersed. Find the rise in the water level in the vessel. [3]
2. In the given figure, O is the center of a circle and ABE is a straight line. [3]
If $\angle CBE = 55^\circ$, find (i) $\angle ADC$ (ii) $\angle ABC$ (iii) value of x.



3. Rani invest Rs. 600 per month for $2\frac{1}{2}$ years in a recurring deposits scheme of SBI. If the bank pays simple interest at $6\frac{2}{3}\%$ per annum, find the amount received by her on maturity.

[4]

Question IV.

1. Solve the inequation, represent it on a number line.

[3]

$$1 \geq 15 - 7x > 2x - 27, x \in N.$$

2. Ashok invested Rs. 26,400 on 12%, Rs. 25 shares of a company, if he receives a dividend of Rs. 2475, find:- the number of shares he bought (ii) Market Value of each share.

[3]

3. Using graph paper, plot $A(2, 0)$, $B(-2, 0)$, $C(3, 2)$ & $D(-3, 2)$.

[4]

a. Join the points ACDB

b. Write the Geometrical name ACDB

c. Reflect the figure ACDB on x axis. Name it $BB'A'A$.

d. Name the figure $DBB'A'AC$.

SECTION - B (Answer any four)

Question V.

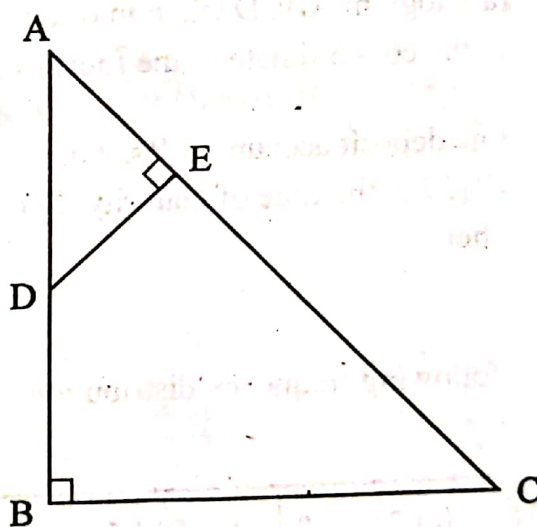
1. Which term AP 5, 12, 19, 26, 33, will be 35 more than its 12th term?

[3]

2. The angle of elevation of a Cloud from a point 100m above the lake is 30° and the angle of depression of its reflection in the lake is 60° , find the height of the cloud from the lake. [3]
3. The model of a building is constructed with scale factor 1:30. [4]
 - a. If the height of the model is 80cm. find the actual height of the building in meter.
 - b. If the actual volume of the tank on the top of the building is 27m^3 , find the volume of the tank on the top of the Model.

Question VI.

1. $\triangle ABC$, $AB = 12\text{cm}$, $\angle B = 90^\circ$ & $AC = 15\text{cm}$, If D and E are points on AB and AC respectively such that $\angle AED = 90^\circ$ and $DE = 3\text{cm}$ then prove that [3]
 - a. $\triangle ABC \sim \triangle AED$
 - b. $\text{Area } \triangle AED = 6\text{cm}^2$
 - c. $\text{Area}(\text{quad } BCED) : \text{area}(ABC) = 8 : 9$



2. Using properties of proportion solve the given $\frac{x^3+12x}{6x^2+8} = \frac{y^3+27y}{9y^2+27}$, find $x+y$. [3]
3. Draw a histogram for the following data. Find its mode also [4]

Class mark	12.5	17.5	22.5	27.5	32.5	37.5
Frequency	7	13	20	29	10	5

Question VII.

1. $\begin{bmatrix} 4 \sin 30^\circ & 2 \cos 60^\circ \\ \sin 90^\circ & 2 \cos 0^\circ \end{bmatrix} \begin{bmatrix} 4 & 5 \\ 5 & 4 \end{bmatrix}$ Evaluate. [3]
2. A solid cone of radius 5cm and height 8cm is melted and made into small spheres each of radius 5cm. Find the number of spheres. [3]
3. Find the equation of the perpendicular drawn from the point $P(2, 3)$ on the line $y = 3x + 4$. Find the co-ordinates of the foot of the perpendicular. [4]

Question VIII.

1. Using ruler and compass only, construct a ΔABC in which $AB = 4cm$, $BC = 5cm$ and $\angle ABC = 120^\circ$ [3]
 - a. Locate the point P such that $\angle BAP = 90^\circ$ and $BP = CP$
 - b. Measure the length of BP .
2. The three vertices of a parallelogram $ABCD$ taken in order are $A(2, -1)$, $B(3, 4)$ and $C(-2, 3)$. Find the co-ordinate of the fourth vertex. [3]
3. Meena has a cumulative time deposit account of Rs. 340 per month at 6% per annum. If she gets Rs. 7157 at the time of maturity, find the total time for which the account was held? [4]

Question IX.

1. Calculate the mean of the following frequency distribution using the short cut method. [4]

Marks	11 – 20	21 – 30	31 – 40	41 – 50	51 – 60	61 – 70	71 – 80
No. of students	2	6	10	12	9	7	4

2. The following Table shows the distribution of marks obtained by a group of 400 student in an examination. [6]

Marks less than	10	20	30	40	50	60	70	80	90	100
Number of student	5	10	30	60	105	180	270	355	390	400