

CBSE SAMPLE PAPER

Class X

Subject: Mathematics

Time 03 Hours.

Max. Marks: 80

General Instructions:

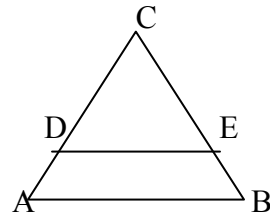
- 1) All questions are compulsory.
- 2) The question paper consists of 25 questions divided into three sections A, B and C. Section A contains 7 questions of 2 marks each, Section B consists of 12 questions of 3 marks each. Section C contains 6 questions of 5 marks each.
- 3) There is no overall choice. However, Internal choice have been provided in 2 questions of 3 marks each, 2 questions of 4 marks each and 2 questions of 6 marks each.
- 4) Write the serial number of question before attempting it.
- 5) In question on construction, the drawing should be neat and exactly as per the given measurements.
- 6) Use of calculators is not permitted. However, you may ask for Mathematical tables.

SECTION A

1. Solve the following system of equation
 $2x + 3y = 7$; $6x - 5y = 11$

2. Express in lowest term: $\frac{9x^2 - (x^2 - 4)^2}{3x + 4 - x^2}$

3. In the following figure $CA = CB$
and $AD = BE$. Prove that $DE \parallel AB$



4. A Radio is available for Rs. 450 cash or Rs. 110 cash down payment followed by 5 equal monthly installments of Rs. 70 each. Find the rate of interest charged under the installment scheme.

5. A loan of Rs. 36,900 was given by the Bank to Mrs. M. Sharma for repair of her house. This loan is to be paid back in four equal annual installments. How much is each installment, if the interest is compounded annually at 25% p.a.
6. For what value(s) of p is the H.C.F of $x^2 + x - (2p + 2)$ and $2x^2 + px - 12, x + 4$?
7. For what value(s) of m , with the equation $x^2 - 2mx + (7m - 12) = 0$ have equal roots.

OR

One side of a rectangle exceeds its other side by 2 cm. If its area is 195 cm², determine the sides of the rectangle.

SECTION B

8. The third term of an A.P. is 25 and the tenth term is -3. Find the first term and the common difference.

OR

Find the sum : $(-5) + (-8) + (-11) + \dots + (-230)$.

9. A sum of Rs. 1000 is invested at 8% simple interest per annum. Calculate the interest at the end of 1,2,3,.....years. Is the sequence of interest an A.P? Find the interest at the end of 40 years.
10. ABC is a right angled triangle in which A is a right angle. If p is the length of perpendicular from A on BC and $AB = c, BC = a$ and $CA = b$, then Prove that

$$\frac{1}{p^2} = \frac{1}{b^2} + \frac{1}{c^2}$$
11. Solve for x : $\frac{x+1}{x-1} + \frac{x-2}{x+2} = 3(x \neq 1, -2)$
12. Solve graphically : $x + 2y = 7 ; 2x - 3y = -7$
13. Construct a triangle ABC in which $AB = 5\text{cm}$, angle $C = 30^\circ$ and median $CD = 4\text{cm}$
14. A circus tent consist of a cylindrical base surmounted by a conical roof. If the common diameter be 56m, the height of the cylindrical portion be 6m and the highest point of the roof be 30m from the ground. Find, in square meters, the area of the canvas used in making the tent
15. Prove the identity $\frac{\tan\theta}{1 - \cot\theta} + \frac{\cot\theta}{1 - \tan\theta} = \sec\theta \cdot \operatorname{cosec}\theta + 1$

OR

With out using trigonometric tables evaluate

$$\frac{\tan 15^{\circ} \cdot \tan 20^{\circ} \cdot \tan 70^{\circ} \cdot \tan 75^{\circ} \cdot \tan 25^{\circ}}{\cot 65^{\circ}}$$

16. Show that the points $(-2,-1)$, $(1,0)$, $(4,3)$ and $(1,2)$ form a parallelogram.

OR

Find the ratio in which the line segment joining the points $(6,4)$ and $(1,-7)$ is divided internally by the axis at x.

17. Find the value of k if the point $p(0,2)$ is equidistant from $(3,k)$ and $(k,5)$.
18. In one day the sales (in rupees) of different items of a baker's shop are given below

Ordinary bread	Rs. 260
Fruit bread	Rs. 60
Cakes	Rs. 100
Biscuits	Rs. 60

Draw a pie chart representing the above sales.

19. One card is drawn from a well shuffled pack of 52 cards. Find the probability of drawing.
- (i) an ace (ii) 2 of spades (iii) 10 of black suit (iv) a king of hearts

SECTION C

20. Find the mean from the following table
- | | | | | | | |
|-----------|----------|----------|----------|----------|----------|----------|
| Class | Below 10 | Below 20 | Below 30 | Below 40 | Below 50 | Below 60 |
| Frequency | 2 | 12 | 21 | 34 | 45 | 56 |
21. Prove that in a right triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides.
Using the above result Prove that in an isosceles triangle ABC right angled at C, $AB^2 = 2AC^2$
22. If a line touches a circle and from the point of contact a chord is drawn, the angles that this chord makes with the given line are equal respectively to the angles formed in the corresponding alternate segment. Using the above result prove that if two circles intersect each other at two points A and B. At A, tangents AP and AQ to the two circles are drawn which intersect circles, at the points P and Q respectively then AB is the bisector of the angle PBQ.

23. The angle of elevation of a Jet plane from a point A on the ground is 60° . After a flight of 15 seconds the angle of elevation changes to 30° , if the jet plane is flying at a constant height of $1500\sqrt{3}$ m, find the speed of the jet plane.

OR

- The angle of depression of the top and the bottom of a 7m tall building from the top of a tower are 45° and 60° respectively. Find the height of the tower.
24. The height of the cone is 42cm. A small cone is cut off at the top by a plane parallel to the base. If its volume is $\frac{1}{27}$ of the height of the volume of the given cone, at what height above the base the section has been made.

OR

An iron pole consisting of a cylindrical portion 110cm high and of base diameter 12cm is surmounted by a cone 9cm high. Find the mass of the pole, given that 1cm^3 of iron has 8gm mass.