

MOCK CBSE BOARD EXAM



MATHEMATICS

CLASS X

(PAPER 1)

(AS PER THE GUIDELINES OF CBSE)

Time: 3 Hours

Max. Marks: 80

General Instructions

1. All the questions are compulsory.
2. The question paper consists of 30 questions divided into four sections A, B, C, and D. Questions 1-10 carry 01 mark each, questions 11-15 carry 02 marks each, questions 16-25 carry 03 marks each, and questions 26-30 carry 06 marks each.
3. There is no overall choice. However, an internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions of 06 marks each. You have to attempt only one of the alternatives in all such questions.
4. Use of calculators is not permitted.

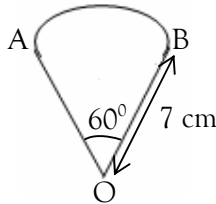
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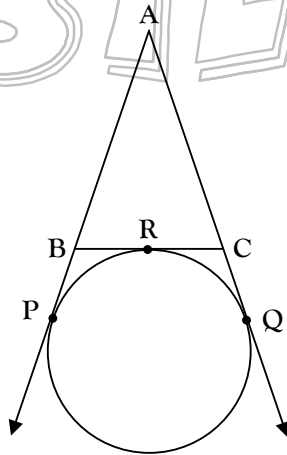
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SECTION - A

1. State Euclid's division lemma.
2. What is the nature of roots of the quadratic equation $2x^2 + 5x + 5 = 0$?
3. For what value of k will the equations, $x + 5y - 7 = 0$, and $4x + 20y + k = 0$ represent coincident lines?
4. Write the polynomial whose zeroes are -5 and 4 .
5. If $\cos A = \frac{3}{5}$, find $9 \cot^2 A - 1$.
6. Find the perimeter of the figure. (Take $\pi = \frac{22}{7}$)



7. In the given figure, find the perimeter of $\triangle ABC$, if $AP = 10$ cm.



8. The point of intersection of the ogives (more than and less than type) is given by $(20.5, 30.4)$. What is the median?
9. A bag contains 5 red balls, 8 white balls, 4 green balls, and 7 black balls. A ball is drawn at random from the bag. Find the probability that it is not green.
10. Find the total surface area of a cuboid with dimensions 10 cm, 8 cm and 6 cm.

SECTION - B

11. If $\sin \theta + \cos \theta = \sqrt{2} \sin (90^\circ - \theta)$, find $\cot \theta$.
12. Solve the following system of linear equations:
 $(a - b)x + (a + b)y = a^2 - 2ab - b^2$, $(a + b)(x + y) = a^2 + b^2$
13. The line joining the point (2, -1) and (5, -6) is bisected at P. If P lies on the line $2x + 4y + k = 0$ find the value of k.
14. In a ΔABC , $AB = AC$ and D is a point on side AC, such that $BC^2 = AC \times CD$. Prove that $BD = BC$
15. A card is drawn from a well shuffled pack of 52 cards. Find the probability that the card drawn is neither a red card nor a queen.

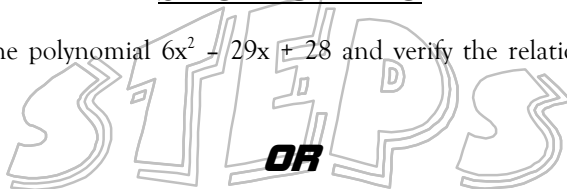
OR

Cards marked with numbers 1, 2, 3,..., 25 are placed in a box and mixed thoroughly and one card is drawn at random from the box. What is the probability that the number on the card is

- (i) an odd number (ii) neither divisible by 5 nor by 10

SECTION - C

16. Find the zeroes of the polynomial $6x^2 - 29x + 28$ and verify the relationship between zeroes and its coefficients.



Divide $x^4 - 2x^2 + 3x^3 + 7x - 2$ by $x^2 + 2$ and verify the division algorithm.

17. Find the value of x, if the sum of the first 14 terms of the A.P. 2x, 5x, 8x, 11x,..... is 1505.

OR

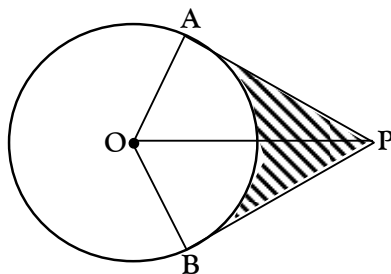
Find the 22nd term of an A.P whose 15th term is 138 and the sum of the first 25 terms exceeds the 25th term by 2772.

18. Evaluate: $2 \frac{\cos 75^\circ}{\sin 15^\circ} - \frac{1}{3} \tan 80^\circ \tan 10^\circ + \frac{3}{5} \frac{\operatorname{cosec} 12^\circ}{\sec 88^\circ} \frac{\operatorname{cosec} 2^\circ}{\sec 78^\circ}$

19. Draw a triangle ABC with BC = 4 cm, AB = 4.5 cm, and AC = 5 cm. Draw another triangle similar to ΔABC such that the sides of the new triangle are equal to $\frac{3}{4}$ of the corresponding sides of ΔABC .

20. Prove that $6 + \sqrt{2}$ is irrational.
21. If (-1, 3), (1, -1) and (5, 1) are the vertices of a triangle, find the length of the median through (5, 1).

22. In the figure, O is the centre of the circle and P is a point 14 cm away from the centre of the circle where PA and PB are tangents to the circle from P. If $\angle APB = 60^\circ$, find the perimeter of the shaded region.



23. Find the ratio of the areas of an equilateral triangle and a square having equal perimeter.
24. A(3, 2) and B(-2, 1) are two vertices of a triangle ABC, whose centroid G has coordinates $\left(\frac{5}{3}, -\frac{1}{3}\right)$. Find the coordinates of the third vertex C of the triangle.
25. From a bus stand in Bangalore, if we buy 2 tickets to Malleswaram and 3 tickets to Yeshwanthpur, the total cost is Rs 46, but if we buy 3 tickets to Malleswaram and 5 tickets to Yeshwanthpur the total cost is Rs 74. Find the fares from the bus stand to Malleswaram, and to Yeshwanthpur.

STEPS

SECTION - D

26. The sum of a two digit number and the number formed by interchanging its digits is 110. If 10 is subtracted from the first number, the new number is 4 more than 5 times the sum of the digits of the first number. Find the first number.

OR

The places A and B are 100 km apart on a highway. One car starts from A and another from B at the same time. If the cars travel in the same direction at different speeds, they meet in 5 hours. If they travel towards each other, they meet in 1 hour. Find their speeds.

27. A 10 m high flagstaff is fixed on the top of a tower. The angle of elevation, of the top of the flagstaff as observed from a point on the ground, is 60° . The angle of depression, of the same point from the top of the tower is 45° . Find the height of the tower.
28. (i) Prove the basic proportionality theorem.
(ii) Use the above theorem to prove that the diagonals of a trapezium cut each other in the same ratio.
29. If h, c and V respectively are the height, the curved surface and volume of a cone, prove that $3\pi Vh^3 - c^2h^2 + 9V^2 = 0$

OR

A bucket made up of a metal sheet is in the form of a frustum of a cone. Its depth is 24 cm and the diameters of the top and bottom are 30 cm and 10 cm respectively. Find the cost of milk which can completely fill the bucket at the rate of Rs. 20 per litre and the cost of the metal sheet used, if it costs Rs. 10 per 100 cm². (Take $\pi = 3.14$)

30. The following table gives the production yield per hectare of wheat of 100 farms of a village.

Production yield (in kg/ha)	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80
Number of farms	2	8	12	24	38	16

Change the distribution to a more than type distribution, and draw its ogive. Obtain the median production yield (kg/ha) from the graph.

