

MM 80

Mock Test - Mathematics Class X

Time 3 hours

Moderate Level: Solve all Black Questions (better choice)

Want Difficult Level paper? Solve Blue alternates

Section A- 1 mark each

1. Find the coordinates of the point on y-axis which is nearest to the point $(-5, 2)$.
2. Find the value(s) of k for which the equation $x^2 + 2kx - 8 = 0$ has real and equal roots
Find the value of k , for which one root of the quadratic equation $kx^2 - 14x + 8 = 0$ is six times the other.
3. If $\cos A = \sin A$, then find the value of $5 \tan A - \cot A$
4. If n th term of an A.P. is $(2n+3)$, what is the sum of its first five terms?
5. In ΔABC , D is a point on AB and E on AC . DE is joined. $AD = 3$ cm, $AB = 5$ cm, $AE = 6$ cm and $AC = 10$ cm and $\angle ABC = 44^\circ$, find $\angle ADE$
6. After how many decimal places will the decimal expansion of $\frac{3}{2^5 \times 2^2}$ terminate?

Section B - 2 marks each

7. If two positive integers p and q are written as $p = a^3$, $q = a^3 b$ where a, b are prime numbers, then verify: $\text{HCF}(p, q) \times \text{LCM}(p, q) = pq$
8. Find first negative term of A.P. 230, 225, 220, 215,
9. If $(1, \frac{r}{2})$ is the mid-point of the line segment joining the points $(2, 0)$ and $(0, \frac{3}{4})$, then show that the line $7x + 3y - 2 = 0$ passes through the point $(-1, 4r)$.
10. Find probability of 5 Sundays in the month of December.
11. A box contains 12 balls of which some are blue in colour. If 6 more blue balls are put in the box and a ball is drawn at random, the probability of drawing a red ball doubles than what it was before. Find the number of red balls in the bag.

One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting
(a) Non Face card (b) Black king or A Red queen

12. Find value of p for unique solution: $3x + 4y = k$ and $5x + 7y = 10$

Section C - 3 marks each

13. Prove that $\sqrt{5}$ is an irrational number.

Prove that $\sqrt{p} + \sqrt{q}$ is an irrational number given p and q are prime numbers.

14. If two zeroes of the polynomial $x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$, find other zeroes

Find remaining zero of $x^3 - 5x^2 - 2x + a$, given that product of its two zeros is 12.

15. Seven times a two-digit number is equal to four times the number obtained by reversing the order of its digits. If the difference of the digits is 3, determine the number graphically

16. The points $A(4, -2)$, $B(7, 2)$, $C(0, 9)$ and $D(-3, 5)$ form a parallelogram. Find the length of the altitude of the parallelogram on the base BC .

17. If $\angle B$ and $\angle Q$ are acute angles such that $\sin B = \sin Q$, then prove that $\angle B = \angle Q$.

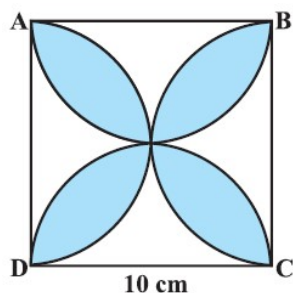
18. Draw a circle and two lines parallel to a given line such that one is a tangent and the other, a secant to the circle.

19. BL and CM are medians of a triangle ABC right angled at A . Prove that $4(BL^2 + CM^2) = 5BC^2$.

In ΔABC , D and E lie on sides AB and AC respectively and $DE \parallel BC$ and $AD:DB = 5:4$.

BE and CD intersect each other at F . Find $\frac{\text{ar}(\Delta DEF)}{\text{ar}(\Delta CFB)}$

20. Find the area of the shaded design in figure, where $ABCD$ is a square of side 10 cm and semicircles are drawn with each side of the square as diameter. (Use $\pi = 3.14$)



ABCD is a trapezium with $AB \parallel DC$, $AB = 18$ cm, $DC = 32$ cm and distance between AB and DC = 14 cm. If arcs of equal radii 7 cm with centres A, B, C and D have been drawn, then find the area of the trapezium not included in the sectors.

21. A cone of maximum size is carved out from a cube of edge 14 cm. Find the surface area of the remaining solid after the cone is carved out.

A hollow cone is cut by a plane parallel to the base and the upper portion is removed.

The surface area of the remainder is $\frac{8}{9}$ of the curved surface area of the whole cone.

Find the ratio of line segments into which the cones altitude is divided by the plane.

22. Draw more than and less than ogive and find median from it, for the following data.

Marks	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50
No. Of students	5	10	20	10	5

Section C - 4 marks each

23. Find roots of $2x^2 - 5x - 4$ by method of completing the squares.
24. 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on. In how rows may are the 200 logs placed and how many logs are in the top row?

The minimum age of children to be eligible to participate in a painting competition is 8 years. It is observed that the age of youngest boy was 8 years and the ages of rest of participants are having a common difference of 4 months. If the sum of ages of all the participants is 168 years, find the age of eldest participant in the painting competition.

25. Ratio of areas of two similar triangles is equal to ratio of squares of corresponding sides. Prove.

In ΔABC , $\angle ABC = 135^\circ$. Prove that $AC^2 = AB^2 + BC^2 + 4 \text{ ar}(\Delta ABC)$

26. Draw a triangle ABC with side $BC = 7$ cm, $AC = 6$ cm and $AB = 5$ cm. Then, construct a triangle whose sides are $\frac{5}{3}$ times the corresponding sides of ΔABC .
27. A spherical balloon of radius r subtends an angle θ at the eye of an observer. If the angle of elevation of its centre is ϕ , find the height of the centre of the balloon.

28. The mean of the following frequency distribution is 50, but the frequencies x and y in classes 20-40 and 60-80, respectively are not known. Find these frequencies, if the sum of all the frequencies is 120.

Weight (in kg)	0-20	20-40	40-60	60-80	80-100
No. Of students	17	X	32	Y	19

29. Water flows through a cylindrical pipe, whose inner radius is 1 cm, at the rate of 80 cm/sec in an empty cylindrical tank, the radius of whose base is 40 cm. What is the rise of water level in tank in half an hour?

A copper wire, 3 mm in diameter, is wound about a cylinder whose length is 12 cm, and diameter 10 cm, so as to cover the curved surface of the cylinder. Find the length and mass of the wire, assuming the density of copper to be 8.88 g per cm^3 .

30. If $a \sin\theta + b \cos\theta = c$, then prove that $a \cos\theta - b \sin\theta = \sqrt{a^2 + b^2 - c^2}$

If $\sec A + \tan A = r$, find value of $\operatorname{cosec} A$

Note: Utmost care has been taken to prepare this Mock Test. cbsemath.com,

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