

Exam Mate



Mock Test Paper for Std X, XII CBSE Board, IIT - JEE Main & Advanced.

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MOCK TEST PAPER # 2 CLASS-X (MATHEMATICS)

Time Allowed : 3 hours

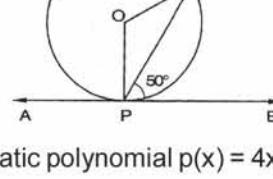
Maximum Marks: 80

GENERAL INSTRUCTIONS

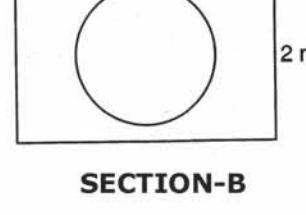
- All questions are compulsory. There are 30 questions in all.
- This question paper has four sections : Section A, Section B, Section C and Section D.
- Section A contains 6 questions of one mark each, Section B contains 6 questions of two marks each, Section C contains 10 questions of three marks each, Section D contains 8 questions of four marks each.
- There is no overall choice. However, an internal choice has been provided in four questions of three marks each and three questions of four marks each. You have to attempt only one of the choices in such questions.
- Use of calculators is not permitted.

SECTION-A

- Find the HCF of 96 and 404 by prime factorization method. Hence, find their LCM.
- If the first term of an A.P. is 2 and common difference is 4, then find the sum of its 40 terms.
- In figure APB is a tangent to a circle with centre O at point P. If $\angle QPB = 50^\circ$, then find the measure of $\angle POQ$.



- If α and β are the zeros of the quadratic polynomial $p(x) = 4x^2 - 5x - 1$, find the value of $\alpha^2\beta + \alpha\beta^2$.
- The mean of first n odd natural numbers is $\frac{n^2}{81}$, then find n .
- Suppose you drop a die at random on the rectangular region shown in figure. What is the probability that it will land inside the circle with diameter 1 m ?



SECTION-B

- Find the greatest number of 6 digits exactly divisible by 24, 15 and 36.

- If -4 is a root of the quadratic equation $x^2 + px - 4 = 0$ and the quadratic equation $x^2 + px + k = 0$ has equal roots, find the value of k .

- If $P(x, y)$ is any point on the line joining the points $A(a, 0)$ and $B(0, b)$, then show that $\frac{x}{a} + \frac{y}{b} = 1$

- The mean of n observations is \bar{x} . If the first observation is increased by 1, the second by 2, the third by 3, and so on, then find the new mean.

- A rhombus of side 20 cm has two angles of 60° each. Find the length of the diagonals.

- A number x is selected from the numbers 1, 2, 3 and then a second number y is randomly selected from the numbers 1, 4, 9. What is the probability that the product xy of the two numbers will be less than 9 ?

SECTION-C

- Prove that one of every three consecutive positive integers is divisible by 3.

14. Solve:

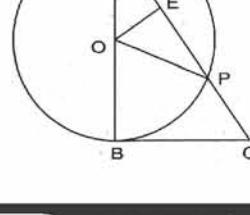
$$2(3u - v) = 5uv$$

$$2(u + 3v) = 5uv$$

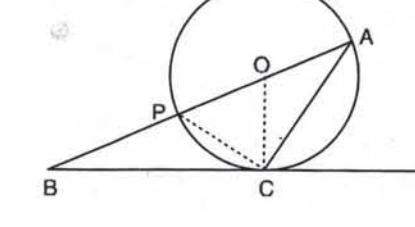
- Prove that the equation $x^2(a^2 + b^2) + 2x(ac + bd) + (c^2 + d^2) = 0$ has no real root, if $ad \neq bc$

- Which term of the A.P. 3, 15, 27, 39,..... will be 120 more than its 21st term ?

- In figure, BC is a tangent to the circle with centre O. OE bisects AP. Prove that $\triangle AEO \sim \triangle ABC$.



OR

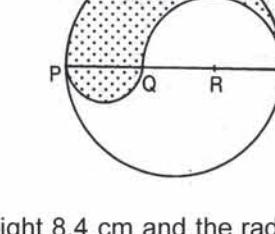
In figure, O is the centre of the circle and BCD is tangent to it at C. Prove that $\angle BAC + \angle ACD = 90^\circ$ 

- O is any point inside a triangle ABC. The bisector of $\angle AOB$, $\angle BOC$ and $\angle COA$ meet the sides AB, BC and CA in point D, E and F respectively. Show that $AD \times BE \times CF = DB \times EC \times FA$

OR

ABC is a triangle in which $AB = AC$ and D is a point on AC such that $BC^2 = AC \times CD$. Prove that $BD = BC$.

- Draw a $\triangle ABC$ with side $BC = 6$ cm, $AB = 5$ cm and $\angle ABC = 60^\circ$. Then construct a triangle whose sides are $(3/4)^{th}$ of the corresponding sides of $\triangle ABC$.
- If $\angle B$ and $\angle Q$ are acute angles such that $\sin B = \sin Q$, then prove that $\angle B = \angle Q$
- PQRS is a diameter of a circle of radius 6 cm. The lengths PQ, QR and RS are equal. Semi-circles are drawn on PQ and QS as diameters as shown in figure. Find the perimeter and area of the shaded region.



- A right circular cone is of height 8.4 cm and the radius of its base is 2.1 cm. It is melted and recast into a sphere. Find the radius of the sphere.

SECTION-D

- If two zeros of the polynomial $f(x) = x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$, find other zeros.
- The sum of the third and seventh terms of A.P. is 6 and their product is 8. Find the sum of first sixteen terms of the A.P.
- Three vertices of a parallelogram ABCD are A(3, -4), B(-1, -3) and C(-6, 2). Find the coordinates of vertex D and find the area of parallelogram ABCD.

OR

If the point (x, y) is equidistant from the points $(a+b, b-a)$ and $(a-b, a+b)$, prove that $bx = ay$

- In trapezium ABCD, $AB \parallel DC$ and $DC = 2AB$. EF drawn parallel to AB cuts AD in E such that $\frac{BE}{EC} = \frac{3}{4}$. Diagonal DB intersects EF at G. Prove that $7FE = 10AB$.

- From the top of a building 60 m high the angles of depression of the top and the bottom of a tower are observed to be 30° and 60° . Find the height of the tower.

OR

A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2 m from the ground. The angle of elevation of the balloon from the eyes of the girl at any instant is 60° . After some time, the angle of elevation reduces to 30° . Find the distance travelled by the balloon during the interval.

- Prove that $(\sin A + \sec A)^2 + (\cos A + \operatorname{cosec} A)^2 = (1 + \sec A \operatorname{cosec} A)^2$.
- A solid consisting of a right cone standing on a hemisphere is placed upright in a right circular cylinder full of water and touches the bottom. Find the volume of water left in the cylinder, if the radius of the cylinder is 60 cm and its height is 180 cm, the radius of the hemisphere is 60 cm and height of the cone is 120 cm, assuming that the hemisphere and the cone have common base.

OR

The height of a right circular cone is trisected by two planes drawn parallel to the base. Show that the volumes of the three portions starting from the top are in the ratio 1 : 7 : 19.

- The mean of the following frequency table is 50. But the frequencies f_1 and f_2 in class 20-40 and 60-80 are missing. Find the missing frequencies.

Class	0-20	20-40	40-60	60-80	80-100	Total
Frequency	17	f_1	32	f_2	19	120

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୨୧ରୁ ରାଜ୍ୟସ୍ଵରୀୟ ସଫ୍ଟବଲ୍ ଟୁମାମେଣ୍ଟ୍

ଡେଙ୍କାନାଳ ଅପ୍ରୀସ, ୧୩୦୧୨

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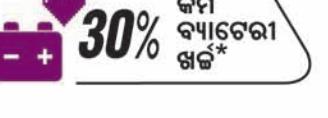
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