

KENDRIYA VIDYALAYA SANGATHAN, HYDERABAD REGION
MOCK TEST PAPER 10 FOR SA - II (2016-17)

SUBJECT: MATHEMATICS

BLUE PRINT : SA-II CLASS X

Unit/Topic	MCQ (1 mark)	Short answer (2 marks)	Short answer (3 marks)	Long answer (4 marks)	Total
Algebra Quadratic Equations & Arithmetic Progression	1(1)	4(2)	6(2)	12(3)	23(8)
Geometry Circles & Construction	1(1)	4(2)	--	12(3)	17(6)
Trigonometry Heights & Distances	1(1)	--	3(1)	4(1)	08(3)
Probability	1(1)	--	3(1)	4(1)	08(3)
Coordinate Geometry	--	4(2)	3(1)	4(1)	11(4)
Mensuration Areas related to Circles & Surface Areas and Volumes	--	--	15(5)	8(2)	23(7)
Total	4(4)	12(6)	30(10)	44(11)	90(31)

MARKING SCHEME FOR SA – II

SECTION	MARKS	NO. OF QUESTIONS	TOTAL
VSA	1	4	04
SA – I	2	6	12
SA – II	3	10	30
LA	4	11	44
GRAND TOTAL			90

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SUBJECT: MATHEMATICS

MAX. MARKS : 90

CLASS : X

DURATION : 3 HRS

General Instructions:

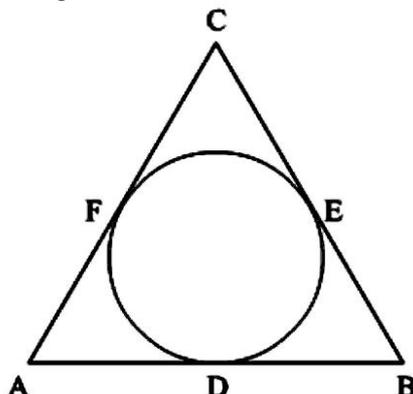
1. All questions are compulsory.
2. Question paper is divided into four sections: Section A consists 4 questions each carry 1 marks, Sections B consists 6 questions each carry 2 marks, Sections C consists 10 questions each carry 3 marks and Sections D consists 11 questions each carry 4 marks.
3. There is no overall choice.
4. Use of Calculator is prohibited.

SECTION – A

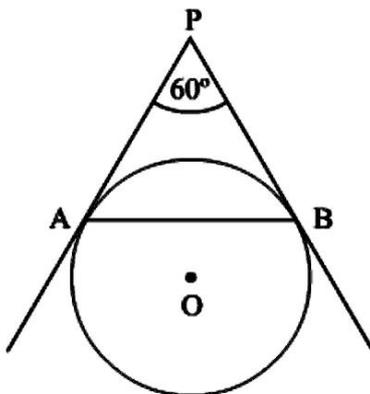
1. From an external point P, tangents PA and PB are drawn to a circle with centre O. If $\angle PAB = 50^\circ$, then find $\angle AOB$.
2. A ladder makes an angle of 60° with the ground when placed against a wall. If the foot of the ladder is 2 m away from the wall, then find the length of the ladder (in metres).
3. Find the 9th term from the end (towards the first term) of the A.P. 5, 9, 13, ..., 185.
4. Cards marked with number 3, 4, 5, ..., 50 are placed in a box and mixed thoroughly. A card is drawn at random from the box. Find the probability that the selected card bears a perfect square number.

SECTION – B

5. If $x = \frac{2}{3}$ and $x = -3$ are roots of the quadratic equation $ax^2 + 7x + b = 0$, find the values of a and b.
6. Find the ratio in which y-axis divides the line segment joining the points A(5, -6) and B(-1, -4). Also find the coordinates of the point of division.
7. In the below figure, a circle is inscribed in a $\triangle ABC$, such that it touches the sides AB, BC and CA at points D, E and F respectively. If the lengths of sides AB, BC and CA are 12 cm, 8 cm and 10 cm respectively, find the lengths of AD, BE and CF.

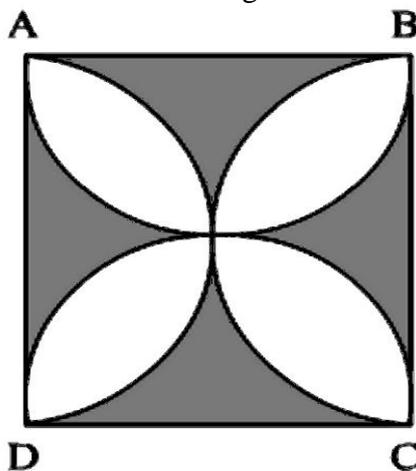


8. The x-coordinate of a point P is twice its y-coordinate. If P is equidistant from Q(2, -5) and R(-3, 6), find the coordinates of P.
9. How many terms of the A.P. 18, 16, 14, be taken so that their sum is zero?
10. In the below figure, AP and BP are tangents to a circle with centre O, such that AP = 5 cm and $\angle APB = 60^\circ$. Find the length of chord AB.



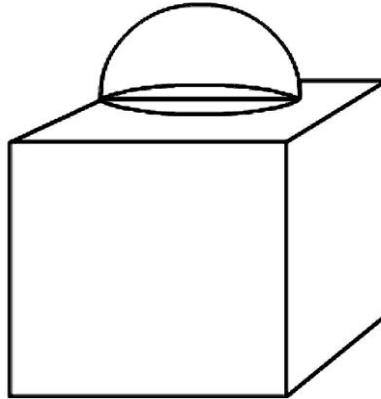
SECTION – C

11. If the sum of first 7 terms of an A.P. is 49 and that of its first 17 terms is 289, find the sum of first n terms of the A.P.
12. Solve for x: $\frac{2x}{x-3} + \frac{1}{2x+3} + \frac{3x+9}{(x-3)(2x+3)} = 0, x \neq 3, \frac{-3}{2}$
13. A well of diameter 4 m is dug 21 m deep. The earth taken out of it has been spread evenly all around it in the shape of a circular ring of width 3 m to form an embankment. Find the height of the embankment.
14. The sum of the radius of base and height of a solid right circular cylinder is 37 cm. If the total surface area of the solid cylinder is 1628 sq. cm, find the volume of the cylinder.
15. In the below figure, ABCD is a square of side 14 cm. Semi-circles are drawn with each side of square as diameter. Find the area of the shaded region.

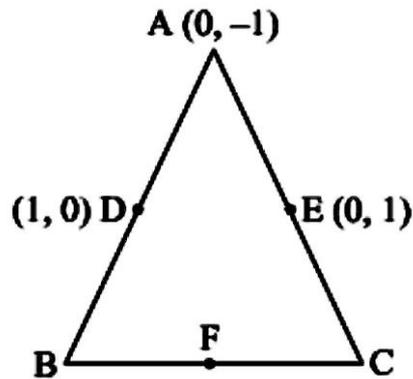


16. The angles of depression of the top and bottom of a 50 m high building from the top of a tower are 45° and 60° respectively. Find the height of the tower and the horizontal distance between the tower and the building. (use)

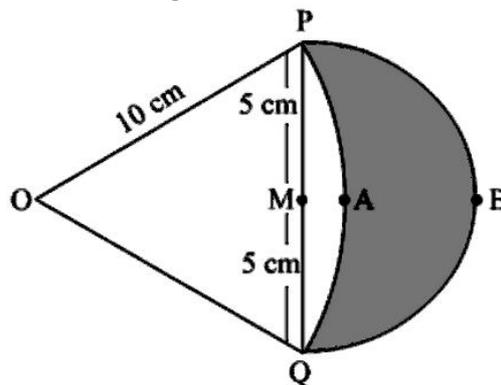
17. In a single throw of a pair of different dice, what is the probability of getting (i) a prime number on each dice? (ii) a total of 9 or 11?
18. In the below figure, is a decorative block, made up two solids – a cube and a hemisphere. The base of the block is a cube of side 6 cm and the hemisphere fixed on the top has diameter of 3.5 cm. Find the total surface area of the block.



19. In the below figure, ABC is a triangle coordinates of whose vertex A are $(0, -1)$. D and E respectively are the mid-points of the sides AB and AC and their coordinates are $(1, 0)$ and $(0, 1)$ respectively. If F is the mid-point of BC, find the areas of $\triangle ABC$ and $\triangle DEF$.



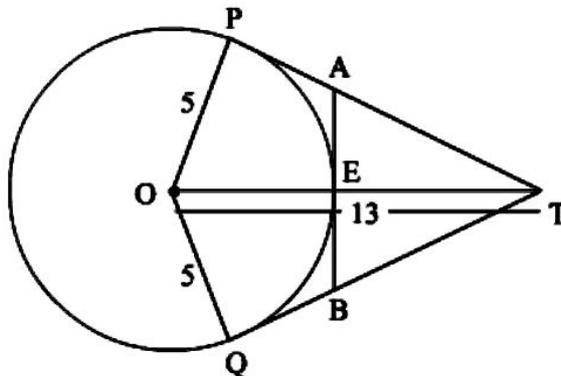
20. In the below figure, are shown two arcs PAQ and PBQ. Arc PAQ is a part of circle with centre O and radius OP while arc PBQ is a semi-circle drawn on PQ as diameter with centre M. If $OP = PQ = 10$ cm show that area of shaded region is



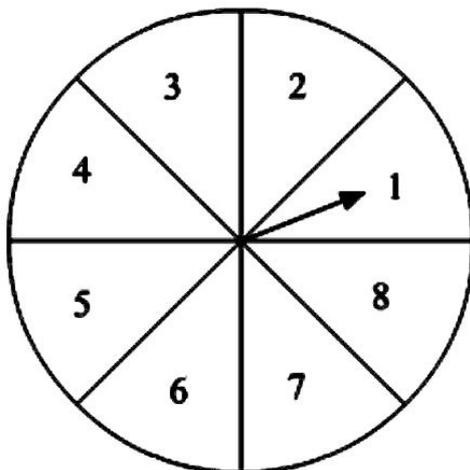
SECTION – D

21. A passenger, while boarding the plane, slipped from the stairs and got hurt. The pilot took the passenger in the emergency clinic at the airport for treatment. Due to this, the plane got delayed by half an hour. To reach the destination 1500 km away in time, so that the passengers could catch the connecting flight, the speed of the plane was increased by 250 km/hour than the usual speed. Find the usual speed of the plane. What value is depicted in this question?

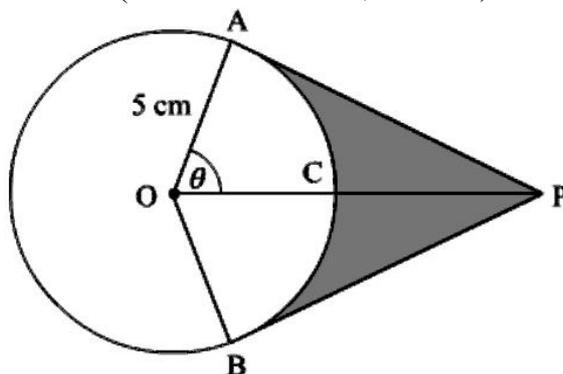
22. Prove that the lengths of tangents drawn from an external point to a circle are equal.
23. Draw two concentric circles of radii 3 cm and 5 cm. Construct a tangent to smaller circle from a point on the larger circle. Also measure its length.
24. In the below figure, O is the centre of a circle of radius 5 cm. T is a point such that OT = 13 cm and OT intersects circle at E. If AB is a tangent to the circle at E, find the length of AB, where TP and TQ are two tangents to the circle.



25. Find x in terms of a, b and c: $\frac{a}{x-a} + \frac{b}{x-b} = \frac{2c}{x-c}$, $x \neq a, b, c$
26. A bird is sitting on the top of a 80 m high tree. From a point on the ground, the angle of elevation of the bird is 45° . The bird flies away horizontally in such a way that it remained at a constant height from the ground. After 2 seconds, the angle of elevation of the bird from the same point is 30° . Find the speed of flying of the bird. (Take $\sqrt{3} = 1.732$).
27. A thief runs with a uniform speed of 100 m/minute. After one minute, a policeman runs after the thief to catch him. He goes with a speed of 100 m/minute in the first minute and increases his speed by 10 m/minute every succeeding minute. After how many minutes the policeman will catch the thief.
28. Prove that the area of a triangle with vertices $(t, t-2)$, $(t+2, t+2)$ and $(t+3, t)$ is independent of t.
29. A game of chance consists of spinning an arrow on a circular board, divided into 8 equal parts, which comes to rest pointing at one of the numbers 1, 2, 3, ..., 8 (see the below figure), which are equally likely outcomes. What is the probability that the arrow will point at (i) an odd number (ii) a number greater than 3 (iii) a number less than 9.



30. An elastic belt is placed around the rim of a pulley of radius 5 cm. (see the below figure) From one point C on the belt, the elastic belt is pulled directly away from the centre O of the pulley until it is at P, 10 cm from the point O. Find the length of the belt that is still in contact with the pulley. Also find the shaded area. (use $\pi = 3.14$ and $\sqrt{3} = 1.73$)



31. A bucket open at the top is in the form of a frustum of a cone with a capacity of 12308.8 cm^3 . The radii of the top and bottom circular ends are 20 cm and 12 cm, respectively. Find the height of the bucket and the area of metal sheet used in making the bucket. (use $\pi = 3.14$)

