

**DELHI PUBLIC SCHOOL:: SURAT****MATHEMATICS
SUMMATIVE ASSESSMENT-2**Roll No :

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Class : X

Marks : 80

Time : 3 Hrs.

General Instructions :

- i. All questions are compulsory.
- ii. The question paper consists of 34 questions divided into 4 sections, section A, B, C, and D. Section A contains 10 questions of 1 mark each, Section B contains 8 questions of 2 marks each, Section C contains 10 questions of 3 marks each and Section D contains 6 questions of 4 marks each.
- iii. Question numbers 1 to 10 in section A are multiple choice questions where you are to select one correct option out of the given four.
- iv. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one of the alternative in all such questions.
- v. Use of calculators is not permitted.

SECTION- A

1. The roots of quadratic equation $2x^2 - 4x + 3 = 0$ are.
(a) real (b) unequal (c) equal (d) not real
2. If $\sin\theta$ and $\cos\theta$ are the roots of the equation $ax^2 + bx + c = 0$, then
(a) $(a - c)^2 = b^2 - c^2$ (b) $(a - c)^2 = b^2 + c^2$
(c) $(a + c)^2 = b^2 - c^2$ (d) $(a + c)^2 = b^2 + c^2$
3. Two parallel lines touch the circle at points A and B respectively. If area of the circle is $25\pi \text{ cm}^2$, then AB is equal to
(a) 5 cm (b) 8 cm (c) 10 cm (d) 25 cm
4. A circle is inscribed in a triangle with sides 8, 15 and 17 cm. The radius of the circle is .
(a) 4 cm (b) 5 cm (c) 3 cm (d) 6 cm

5. The area of a circle is 38.5 square cm. Its circumference is
 (a) 5 cm (b) 14 cm (c) 22 cm (d) 196 cm
6. The radius of circle is 50 cm. If the radius is decreased by 50%, its area will decreased by
 (a) 50% (b) 75% (c) 80% (d) 25%
7. A rectangular block 6 cm × 12 cm × 15 cm is cut into exact number of equal cubes. The least possible number of cubes will be
 (a) 5 (b) 11 (c) 33 (d) 40
8. A solid sphere of radius 10 cm is moulded into 8 spherical solid balls of equal radius, then the radius of each ball is
 (a) 2 cm (b) 3 cm (c) 4 cm (d) 5 cm
9. From the top of a cliff 25 m high, the angle of elevation of the top of a tower is found to be equal to angle of depression of the foot of the tower. The height of the tower is
 (a) 40 m (b) 50 m (c) 60 m (d) 75 m
10. A man is known to speak truth 5 out of 7 times. He draws a face card from a pack of 52 cards. Find the probability that he reports it is a face card.
 (a) $\frac{2}{7}$ (b) $\frac{2}{13}$ (c) $\frac{5}{7}$ (d) $\frac{10}{13}$

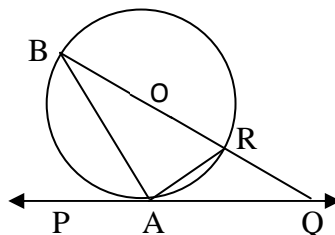
SECTION- B

11. One root of the equation $2x^2 - 8x - m = 0$ is $\frac{5}{2}$. Find the other root and value of m.

OR

Find the roots of the equation $5x^2 - 2\sqrt{15}x + 3 = 0$

12. Find the sum all two digits odd positive numbers.
13. In figure, O is centre of the circle; PQ is a tangent to the circle at A. If $\angle PAB = 58^\circ$, find the $\angle ABQ$ and $\angle AQB$.



14. What is the perimeter of a sector of angle 45° of a circle with radius 7 cm?

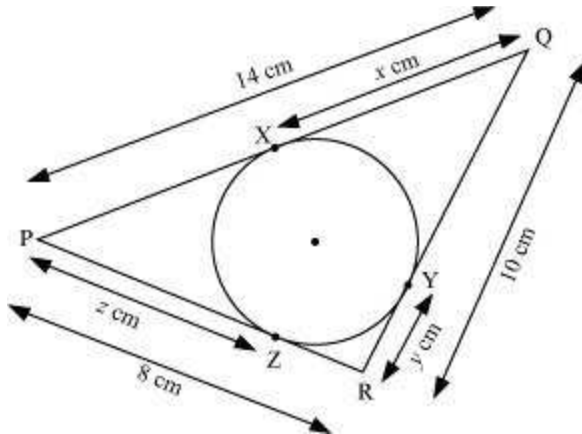
15. The diameter of a sphere is 42 cm. It is melted and drawn into a cylindrical wire of 28cm diameter. Find the length of the wire.
16. A(3, 2) and B(-2, 1) are the two vertices of a triangle ABC, whose centroid G has coordinates $(\frac{5}{3}, \frac{-1}{3})$. Find the coordinates of the third vertex C of the triangle.
17. Find the value of k such that the point (0 , 2) is equidistant from the points (3, k) and (k , 5).
18. Find the probability of getting a number less than 5 in a single throw of a dice.

SECTION- C

19. Rs. 9000 were divided equally among a certain number of persons. Had there been 20 more persons, each would have got Rs. 160 less. Find the original no. of persons.
20. If 5th and 15th terms of an AP 13 and -17 respectively. Find the sum of first 25 terms of AP.
21. Prove that the parallelogram circumscribing a circle is a rhombus.

OR

From the given figure, find the lengths QX, YR, and PZ.

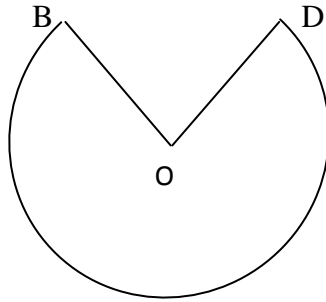


22. In an equilateral triangle of side 24 cm, a circle is inscribed touching its sides, find the area of the remaining portion.

OR

A piece of wire is in the form of an arc of a circle of radius 20 cm, subtending an angle of 150° at the centre of the circle. If it is bent into the form of a largest complete circle, find the radius of this circle.

23. Marbles of diameter 1.4 cm are dropped into a cylindrical beaker, of diameter 7 cm, containing some water. Find the marbles that should be dropped into the beaker so that the water level rises by 5.6 cm.
24. In fig., the shape of the top of a table in restaurant is that of a sector of a circle with centre O and $\angle BOD = 90^\circ$, if $BO = OD = 60$ cm, find :

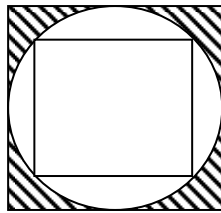


- (i) the area of the top of the table
(ii) the perimeter of the table top. (take $\pi = 3.14$)
25. Two boats approach a light house in mid-sea from opposite directions. The angles of elevations of the top of light house from two boats are 30° and 45° respectively. If the distance between two boats is 100 m, find the height of the light house.
26. Find the value of k if the points $(k, 3)$, $(6, -2)$ and $(-3, 4)$ are collinear.
- OR**
- Find the co-ordinates of the circumcentre of the triangle ABC; whose vertices A, B and C are $(5, 3)$, $(5, -5)$ and $(1, -5)$ respectively.
27. Find the coordinates of a point which divides internally the line segment joining the points $(-1, 7)$ and $(4, -3)$ in the ratio 2 : 3
28. Cards bearing numbers 1, 3, 5, ..., 35 are kept in a bag. A card is drawn at random from the bag. Find the probability of getting a card bearing
- (a) a prime number less than 15.
(b) A number divisible by 3 and 5.

SECTION- D

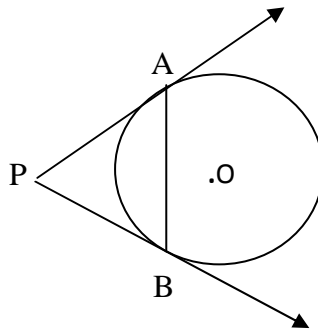
29. A motor-boat, whose speed is 9 km/h in still water, goes 12 km downstream and comes back in a total time of 3 hours. Find the speed of the stream.

30. Find the sum of the integers between 100 and 200 that are
- divisible by 9
 - not divisible by 9
31. Construct ΔABC with $\angle B = 90^\circ$, $BC = 7\text{cm}$ and $AB = 6\text{cm}$. Then construct another triangle similar to ΔABC so that the corresponding sides of the second triangle be $\frac{2}{3}$ times than those of the ΔABC .
32. A circle has been inscribed in a square of side 4 cm. Determine the left out area. Also What will be the left out area of the circle if a square is inscribed in this circle ?
(Use $\pi = 3.14$)



OR

In figure, PA and PB are two tangents drawn to a circle with centre O, from an external point P such that $PA = 5\text{ cm}$ and $\angle APB = 60^\circ$. Find the length of chord AB.



33. A solid is hemisphere at the bottom and conical at above. If curved surface area of the two parts are equal then what is the ratio of its radius to height of its conical part ?
34. Two stations due South of a leaning tower which leans towards the North are at a distances of 'a' and 'b' from its foot. If ' α ' and ' β ' be the elevations of the top of the tower from these stations, prove that its inclination ' θ ' to the horizontal is given by :

$$\cot\theta = \frac{bcot\alpha - acot\beta}{b-a}$$

OR

At a point on level ground, the angle of elevation of a vertical tower is found to be such that its tangent is $\frac{5}{12}$. On walking 192 metres towards the tower, the tangent of the angle is found to be $\frac{3}{4}$. Find the height of the tower.

END OF THE EXAMINATION