

Sample Paper
CLASS-X
Mathematics

Time: 3 hours

Marks: 90

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper contains 34 questions divided into four sections A, B, C and D. Section – A comprises of 8 questions of 1 mark each; Section – B comprises of 6 questions of 2 marks each; Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 10 questions of 4 marks each.
- (iii) Question number 1 to 8 in Section – A are multiple choice questions where you are required to select one correct option out of the given four.
- (iv) There is no overall choice. However, internal choices have 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 alternatives in all such questions.

Section A

Choose the correct answer.

1. An A.P. whose first term is 10 and common difference is 2, is :
a. 10, 13, 16, 19 ... b. 5, 7, 9, 11, ... c. 8, 12, 16, 20, ... d. None of these
2. If the numbers a, b, c are in A.P., then :
a. $b - a = c - b$ b. $b + a = c + b$ c. $a - b = b - c$ d. none of these
3. The roots of the equation $ax^2 + x + b = 0$ are equal if -
a. $b^2 = 4a$ b. $b^2 < 4a$ c. $b^2 > 4a$ d. $ab = \frac{1}{4}$
4. PQ and PT are tangents drawn from a point P to a circle with centre O such that $\angle QPT = 60^\circ$, then $\angle QOT$ is equal to
a. 60° b. 30° c. 90° d. None of these
5. If the height and length of the shadow of a man are the same, then the angle of elevation of the sun is :

- a. 30° b. 60° c. 45° d. 15°

6. Mohan is asked to select a number from 1 to 20. The probability that the selected number is a prime number is ;
 (a) $\frac{1}{2}$
 (b) $\frac{3}{2}$
 (c) $\frac{1}{5}$
 (d) None of these
7. The perpendicular distance of A (5, 12) from the y-axis is :
 a. 13 units b. 5 units c. 12 units d. 17 units
8. If two solid hemispheres of same base radius x are joined together along their bases, then curved surface area of the new solid is :
 (a) $4\pi x^2$
 (b) $3\pi x^2$
 (c) $5\pi x^2$
 (d) None of these

Section B

9. If 8th term of an A.P. is 31 and 15th term is 16 more than 11th term, find the A.P.
10. Solve the following equations by completing the squares, $y^2 + \frac{1}{2}y - 1 = 0$
11. For what value of k , the roots are real and equal in $(k + 1)x^2 + 2(k + 3)x + (k + 8) = 0$

12. Out of the two concentric circles, the radius of the outer is 5 cm and the chord AC of length 8 cm is a tangent to the inner circle. Find the radius of the inner circle.

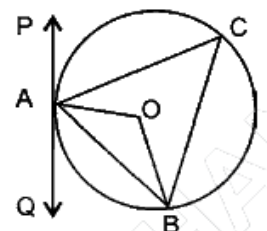
13. What will be the increase in area of a circle, if its radius is increased by 20%?

14. Two cubes each of edge 4 cm are joined face to face. Find the surface area of the resulting cuboid.

Section C

15. A sum of Rs 2700 is to be used to give eight cash prizes to students of a school for their overall academic performance. If each prize is Rs 25 more than its preceding prize, find the value of each of the prizes.

16. At present Ram age (in years) is 2 more than the square of her daughter Nisha's age. When Nisha grows to her mother's present age, Ram's age would be one year less than 10 times the present age of Nisha. Find the present ages of both Ram and Nisha.

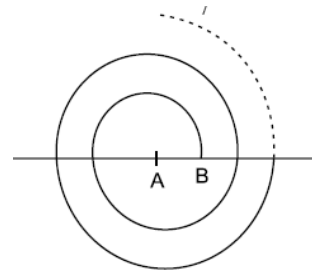


17. PAQ is a tangent to the circle with centre O at a point A as shown in the figure. If $\angle OBA = 35^\circ$, find the value of $\angle BAQ$ and $\angle ACB$.
18. Construct a tangent to a circle of radius 4 cm from a point which is at a distance of 6 cm from its centre.
19. An aircraft is flying at a constant height with a speed of 360 km/hour. From a point on the ground, the angle of elevation at an instant was observed to be 45° . After 10 seconds, the angle of elevation was observed to be 30° . Determine the height at which the aircraft is flying. (Use $\sqrt{3} = 1.732$)
20. A bag contains 20 balls of which x are white. If 6 more white balls are added to the bag, the probability of drawing a white ball is 0.4, find the value of x .
21. Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are $(0, -1)$, $(2, 1)$ and $(0, 3)$.
22. Show that $(4, -1)$, $(6, 0)$, $(7, 2)$ and $(5, 1)$ are the vertices of a rhombus. Is it a square?

23. Diameters of three concentric circles are in the ratio 1: 2: 3. The sum of the circumferences of these circles is 264 cm. Find the area enclosed between second and third circles.
24. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 5 km/h. How much area will it irrigate in 30 minutes, if 4 m of standing water is needed?

Section D

25. A spiral is made up of successive semicircles, with centers alternatively at A and B, starting with centre at A of radii 0.5 cm, 1 cm, 1.5 cm, 2 cm.... as shown in the figure. What is the total length of such spiral made up of thirteen consecutive semicircles?



26. A trader bought a number of articles for Rs 900; He wants a profit of Rs 80. Five articles were found damaged. He sold each of the remaining articles at Rs 2 more than what he paid for it and then he got a profit of Rs 80 on the whole transaction. Find the number of articles he bought. What value is shown by the trader?
27. Let s denote the semi perimeter of a ΔABC in which $BC = a$, $CA = b$ and $AB = c$. If a circle touches BC , CA and AB at D , E and F respectively, prove that $BD = s - b$.
28. Construct a ΔABC in which $BC = 6.5$ cm, $AB = 4.5$ cm and $\angle ABC = 60^\circ$. Construct a triangle similar to this triangle whose sides are $\frac{4}{5}$ th of the corresponding sides of the triangle ABC .

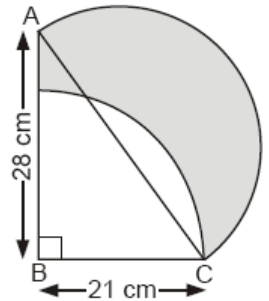
29. A round balloon of radius r subtends an angle α at the eye of the observer while the angle of elevation of its centre is β . Prove that the height of the centre of the balloon is $r \sin \beta \operatorname{cosec} \alpha/2$.

30. All the three face cards of spades are removed from a well shuffled pack of 52 cards. A card is then drawn at random from the remaining pack. Find the probability of getting;

- a. Black face card b. A queen c. A black card.

31. Find the centre of a circle passing through the points $(6, -6)$, $(3, -7)$ and $(3, 3)$.

32. In the figure, ABC is a right-angled triangle, $\angle B = 90^\circ$, $AB = 28$ cm and $BC = 21$ cm. With AC as diameter, a semi-circle is drawn and with BC as radius a quarter circle is drawn. Find the area of the shaded region.



33. A well with 7 m inside diameter is dug 20 m deep, earth taken out of it has been spread all round it to a width of 10.5 m to form an embankment. Find the height of the embankment so formed.
34. Solid spheres of diameter 6 cm each are dropped into a cylindrical beaker containing some water and are fully submerged. The water in the beaker rises by 40 cm. Find the number of solid spheres dropped into the beaker if the diameter of the beaker is 18 cm.

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