

SECTION - A

Question numbers 1 to 10 carry 1 mark each. For each of the questions 1 to 10 four alternative choices have been provided of which only one is correct. You have to select the correct choice.

1. If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then the value of k is :

(A) $\frac{1}{2}$ (B) -2 (C) $\frac{1}{4}$ (D) 2

2. The value of k for which $3x^2 + 2x + k = 0$ has real roots is :

(A) $k > \frac{1}{3}$ (B) $k \leq \frac{1}{3}$ (C) $k \geq \frac{1}{3}$ (D) $k < \frac{1}{3}$

3. In Fig.1, RQ is a tangent to the circle with centre O. If SQ = 12 cm and QR = 8 cm, then OR is equal to :

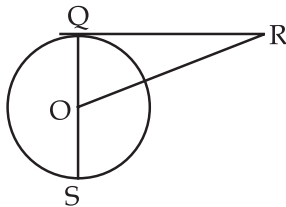


Fig.1

(A) 16 cm (B) 9 cm (C) 5 cm (D) 10 cm

4. The distance between two parallel tangents of a circle of radius 3 cm is :

(A) 6 cm (B) 3 cm (C) 4.5 cm (D) 12 cm

5. In Fig.2, if PT is a tangent to the circle with centre O and $\angle TPO = 25^\circ$, then the measure of x is :

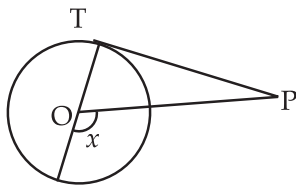
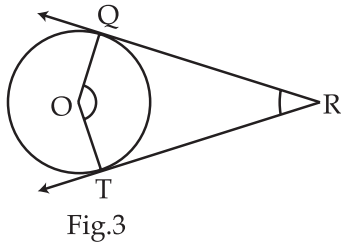


Fig.2

(A) 120° (B) 125° (C) 110° (D) 115°

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6. In fig.3, $\angle QOT = 135^\circ$ then $\angle QRT$ is :



- (A) 35° (B) 45° (C) 90° (D) 60°
7. The number of cubes of side 2 cm which can be cut from a cube of side 6 cm is :
(A) 56 (B) 54 (C) 28 (D) 27
8. If the diameter of a protractor is 7 cm, then its perimeter is :
(A) 18 cm (B) 20 cm (C) 22 cm (D) 26 cm
9. The tops of two poles of height 16 m and 10 m are connected by a wire. If the wire makes an angle of 30° with the horizontal, then the length of the wire is :
(A) 26 m (B) 10 m (C) 12 m (D) 16 m
10. The sum of probability of all the events of an experiment is :
(A) $\frac{2}{3}$ (B) 3 (C) 1 (D) 2

SECTION - B

Question numbers 11 to 18 carry 2 marks each.

11. Find the roots of the following quadratic equation :

$$(x + 3)(x - 1) = 3\left(x - \frac{1}{3}\right)$$

12. How many terms are there in A.P. ?
7, 16, 25,, 349 ?
13. Two concentric circles are of radii 10 cm and 6 cm. Find the length of the chord of the larger circle which touches the smaller circle.

14. How many times will the wheel of a car rotate in a journey of 2002 m, if the radius of the wheel is 49 cm ?
15. A cubical solid block of metal $49 \text{ cm} \times 44 \text{ cm} \times 18 \text{ cm}$ is melted and formed into a solid sphere. Calculate the radius of the sphere.
16. Find the value of p , for which the points $(1, 3)$, $(3, p)$ and $(5, -1)$ are collinear.
17. Find the point on the x -axis which is equidistant from the points $(-2, 5)$ and $(2, -3)$.
18. A box contains cards numbered from 1 to 17. If one card is drawn at random from the box, find the probability that it bears a prime number.

OR

A card is drawn from a well shuffled pack of 52 cards. Find the probability that the card drawn is neither a black card nor a queen.

SECTION - C

Question numbers 19 to 28 carry 3 marks each.

19. Find two natural numbers, which differ by 3 and whose squares have the sum 149.

OR

Solve for x : $\frac{4}{x} - 3 = \frac{5}{2x + 3}$, $x \neq 0, \frac{-3}{2}$

20. Find the sum of all two digit odd positive numbers.
21. In fig.4, XP and XQ are tangents from an external point X to the circle with centre O . R is a point on the circle where another tangent ARB is drawn to the circle. Prove that $XA + AR = XB + BR$.

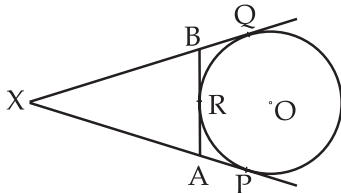


Fig.4

22. Draw a ΔABC in which $AB = 5 \text{ cm}$, $AC = 6 \text{ cm}$ and $BC = 7 \text{ cm}$. Then draw another triangle whose sides are $\left(\frac{3}{5}\right)$ times the corresponding sides of ΔABC .

23. A race track is in the form of a ring whose inner circumference is 352 m and outer circumference is 396 m. Find the width of the track $\left(\text{use } \pi = \frac{22}{7}\right)$.

24. A cone of height 24 cm and diameter of base 12 cm is made up of modelling clay. A child reshapes it in the form of a sphere. Find the total surface area of the sphere.

OR

A toy is in the form of a cone mounted on a hemisphere of same radius 3.5 cm and total height of the toy is 15.5 cm, find the total surface area and the volume of the toy.

25. The height of a tower is 45 m. If the angle of elevation of sun is 30° , find the length of the shadow formed at that time (Take $\sqrt{3} = 1.73$).

OR

Find the area of ΔPQR such that $\angle Q = 90^\circ$, $PR = 10$ cm and $\angle PRQ = 30^\circ$.

(Take $\sqrt{3} = 1.73$)

26. Show that the points $A(a, a)$, $B(-a, -a)$ and $C(-a\sqrt{3}, a\sqrt{3})$ form an equilateral triangle.

27. If the points $(6, 1)$, $(8, 2)$, $(9, 4)$ and $(p, 3)$ are the vertices of a parallelogram, in order, find the value of p .

28. A pair of dice is thrown once.

- (i) Write sample space for the experiment.
(ii) Find the probability of getting an odd number on each dice.

SECTION - D

Question numbers 29 to 34 carries 4 marks each.

29. A train travels 300 km at a uniform speed. If the speed of the train had been 5 km/hour more, it would have taken 2 hours less for the same journey. Find the usual speed of the train.

OR

The sum of two natural numbers is 8. Determine the numbers, if the sum of their reciprocals is $\frac{8}{15}$.

30. A woman takes up a job of Rs. 8000 per month with an annual increment of Rs. 100. What will she earn over a period of 10 years ?
31. Prove that lengths of tangents drawn from an external point to a circle are equal.
32. Wax cylinder of diameter 21 cm and height 21 cm is chipped off and shaped to form a cone of maximum volume. The chipped off wax is recast into a solid sphere. Find the diameter of the sphere.
33. A bucket made up of a metal sheet is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper circular ends as 8 cm and 20 cm respectively. Find how many square metre of metal is used for making the bucket.
34. From the top of a 50 m high tower, the angles of depression of the top and bottom of a pole are observed to be 30° and 45° respectively. Find the height of the pole.
(Take $\sqrt{3} = 1.73$)

OR

A vertical tower is surmounted by a flag staff of height 5 metres. At a point on the ground, the angles of elevation of bottom and top of flag staff are 45° and 60° respectively. Find the height of the tower.

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