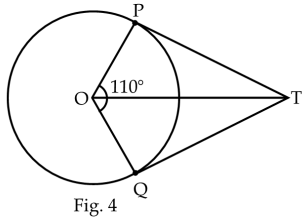


30. Neera saves Rs. 1600 during the first year, Rs. 2100 in the second year, Rs. 2600 in the third year. If she continues her savings in this pattern, in how many years will she save Rs. 38500 ?
31. Prove that, the tangent at any point of a circle is perpendicular to the radius through the point of contact.

Using the above, find $\angle PTQ$ in Fig.4, if TP and TQ are the two tangents to a circle with centre O so that $\angle POQ = 110^\circ$.



32. A solid toy is in the form of a hemisphere surmounted by a right circular cone of the same base radius. The height of the cone is 2 cm and diameter of the base is 4 cm. Determine the volume of the toy. If a right circular cylinder circumscribes the toy, find the difference of the volumes of the cylinder and the toy. [Take $\pi = 3.14$]

OR

A well of diameter 3 m is dug 14 m deep. The earth taken out of it has been spread evenly all around it in the shape of a circular ring of width 4 m to form an embankment. Find the height of the embankment.

33. A farmer connects a pipe of internal diameter 20 cm from the canal into a cylindrical tank in his field which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3km/hour in how much time will the tank be filled ?
34. From the top of a tower 50 m high the angles of depression of the top and bottom of a pole are observed to be 45° and 60° respectively. Find the height of the pole, if the pole and tower stand on the same plane.

Mega Test - 2

Time: 3 h

Max Marks: 80

Section A (1 mark each)

- If one root of the equation $2x^2 - 10x + p = 0$ is 2 then the value of p is :
(A) -3 (B) -6 (C) 9 (D) 12
- If a, a-2 and 3a are in A.P, then the value of a is :
(A) -3 (B) -2 (C) 3 (D) 2
- In two concentric circles, if chords are drawn in the outer circle which touch the inner circle, then
(A) All chords are of different lengths
(B) All chords are of same length
(C) Only parallel chords are of same length
(D) Only perpendicular chords are of same length.
- In Fig. 1, two tangents are drawn from an external point P to the circle such that $\angle OBA = 10^\circ$. Then the value of $\angle BPA$ is :
(A) 10° (B) 20° (C) 30° (D) 40°
- A tangent PQ at the point P of a circle meets a line through the centre O at a point Q, so that $OQ = 12$ cm and $PQ = \sqrt{119}$ cm, the diameter of circle is :
(A) 13 cm (B) 26 cm (C) 10 cm (D) 5 cm
- In Fig.2, a quadrilateral ABCD drawn to circumscribe a circle. Then

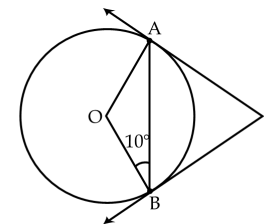


Fig. 1

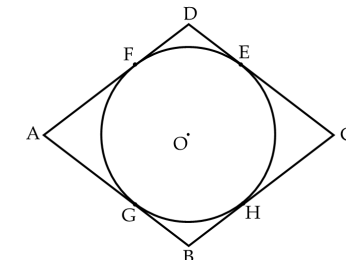


Fig. 2

- (A) $AD + BC = AB + CD$ (B) $AB + BC = AD + CD$
(C) $BC + CD = AD + AB$ (D) $AB + BC + CD + AD = AC + BD$
7. The radii of two cylinders are in the ratio of 2 : 3 and their heights are in the ratio 5 : 3. The ratio of their volumes is :
(A) 27 : 24 (B) 20 : 27 (C) 9 : 4 (D) 4 : 9

8. The area of a circle whose circumference is 44 cm is :
 (A) 152 cm^2 (B) 153 cm^2 (C) 154 cm^2 (D) 150 cm^2
9. Two coins are tossed simultaneously. The probability of getting atleast one head is :
 (A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) 0
10. If the angle of elevation of top of a tower from a point at a distance of 100 m from its foot is 60° , then the height of the tower is :
 (A) $50\sqrt{3} \text{ m}$ (B) $\frac{200}{\sqrt{3}} \text{ m}$ (C) $\frac{100}{\sqrt{3}} \text{ m}$ (D) $100\sqrt{3} \text{ m}$

Section B (2 marks each)

11. Find the roots of the following quadratic equation by factorisation method.
 $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$
12. If the n^{th} term of an A.P. is $(2n + 1)$, find the sum of first n terms of the A.P.
13. Find the length of the tangent drawn from a point, whose distance from the centre of the circle is 5 cm and radius of the circle is 3 cm.
14. The perimeter of a sector of a circle of radius 5.6 cm is 27.2 cm. Find the area of the sector.
15. A spherical solid ball of diameter 21 cm is melted and recast into cubes, each of side 1 cm. Find the number of cubes thus formed. [use $\pi = \frac{22}{7}$]
16. If the point $P(x, y)$ is equidistant from the points $A(5, 1)$ and $B(-1, 5)$ then prove that $3x = 2y$.
17. Find the co-ordinates of a point A, where AB is the diameter of a circle whose centre is $(2, -3)$ and B is $(1, 4)$.
18. A card is drawn at random from a well-shuffled pack of 52 cards. Find the probability that the card drawn is neither a red card nor a queen.

OR

Two dice are thrown once. Find the probability of obtaining :

- (i) a total of 6 of numbers on both dice.
 (ii) the same number on both dice.

Section C (3 marks each)

19. Solve for x : $\frac{x}{x+1} + \frac{x+1}{x} = \frac{34}{15}$

OR

Find the roots of the quadratic equation $2x^2 + x - 4 = 0$.

20. Find the sum of all the two-digit natural numbers which are divisible by 4.
21. In Fig.3, a circle touches the side BC of a ΔABC at P and touches AB and AC when produced at Q and R respectively. Then show that $AQ = \frac{1}{2}(\text{Perimeter of } \Delta ABC)$

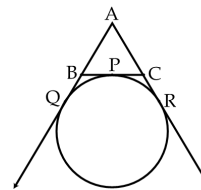


Fig. 3

OR

Prove that the parallelogram circumscribing a circle is a rhombus.

22. Draw a triangle ABC with side $BC = 4 \text{ cm}$, $\angle B = 45^\circ$, $\angle C = 30^\circ$. Then construct a triangle whose sides are $\frac{3}{4}$ times the corresponding sides of ΔABC .
23. A square of side 4 cm is inscribed in a circle. Find the area enclosed between the circle and the square. [use $\pi = \frac{22}{7}$]
24. From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^2 . [use $\pi = \frac{22}{7}$]

OR

Right circular cylinder having diameter 12 cm and height 15 cm is full of ice-cream. This ice-cream is to be filled in cones of height 12 cm and diameter 6 cm having a hemispherical shape on the top. Find the number of such cones which can be filled with ice-cream.

25. The angles of elevation of the top of a tower, as seen from two points A and B situated in the same line and at distances p and q respectively, from the foot of the tower, are 30° and 60° respectively. Prove that the height of the tower is \sqrt{pq}
26. Find the values of y for which the distance between the points $P(2, -3)$ and $Q(10, y)$ is 10 units.
27. Find the area of a rhombus if the vertices are $(3, 0)$, $(4, 5)$, $(-1, 4)$ and $(-2, -1)$ taken in order.
28. Cards marked with numbers 13, 14, 15,, 60 are placed in a box and mixed thoroughly. One card is drawn at random from the box. Find the probability that the number on the drawn card is :
 (i) divisible by 5
 (ii) a number which is a perfect square.

Section D (4 marks each)

29. A man bought a certain number of toys for Rs. 180. He kept one for his own use and sold the rest for one rupee each more than he gave for them. Besides getting his own toy for nothing, he made a profit of Rs. 10. Find the number of toys, he initially bought.

OR

A farmer wishes to start a 100 sq.m. rectangular vegetable garden. Since, he has only 30 m barbed wire, he fences three sides of the rectangular garden letting his house compound wall act as the fourth side of the fence. Find the dimensions of his garden.