

10TH CBSE MATHEMATICS

2011*

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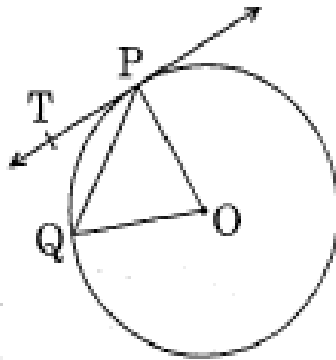
1.1. The roots of the equation constant, are $x - 3x - m(m+3) = 0$, where m is a constant are

- a) $m, m+3$
- b) $-m, m+3$
- c) $m, -(m+3)$
- d) $-m, -(m+3)$

1.2. If the common difference of an A.P. is 3, then $a_{20} - a_{15}$ is

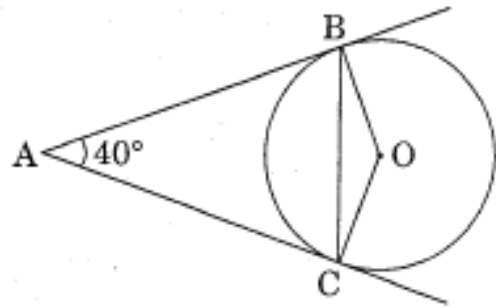
- a) 5
- b) 3
- c) 15
- d) 20

1.3. In figure 1, O is the center of a circle, PQ is a chord and PT is the tangent at P . If $\angle POQ = 70^\circ$ then $\angle TPQ$ is equal to



- a) 55°
- b) 70°
- c) 45°
- d) 35°

1.4. In figure 2, AB and AC are the tangents to the circle with the center O such that $\angle BAC = 40^\circ$. Then $\angle BOC$ is equal to



- a) 40°
- b) 50°
- c) 140°
- d) 150°

1.5. The perimeter (in cm) of a square circumscribing a circle of radius a cm is

- a) $8a$
- b) $4a$
- c) $2a$
- d) $16a$

1.6. The radius (in cm) of the largest right circular cone that can be cut out from a cube of 4.2 cm is

- a) 4.2
- b) 2.2
- c) 8.4
- d) 1.05

1.7. A tower stands vertically on the ground. From a point on the ground which is 25 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 45° . Then the height (in meters) of the tower is

- a) $25\sqrt{2}$
- b) $25\sqrt{3}$
- c) 25
- d) 12.5

1.8. If $P(\frac{a}{2}, 4)$ is the mid point of the line joining the points $A(-6, 5)$ and $B(-2, 3)$ then the value

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of a is

- a) -8
- b) 3
- c) -4
- d) 4

1.9. If A and B are the points $(-6,7)$ and $(-1,-5)$ respectively, then the distance $2AB$ is equal to

- a) 13
- b) 26
- c) 169
- d) 238

1.10. A card is drawn from the well shuffled deck of 52 playing cards. The probability that the card will not be an ace is

- a) $\frac{1}{13}$
- b) $\frac{1}{12}$
- c) $\frac{4}{13}$
- d) $\frac{3}{4}$

1.11. Find the value of m so that the quadratic equation $mx(x-7)+49=0$ has two equal roots

1.12.

1.13. Find how many two digit numbers are divisible by 6 $x^2 - 3\sqrt{5}x + 10 = 0$

1.14. In Figure 3, a circle touches all the four sides of a quadrilateral ABCD whose sides are $AB=6\text{cm}$, $BC=9\text{cm}$ and $CD=8\text{cm}$. Find the length of side AD.

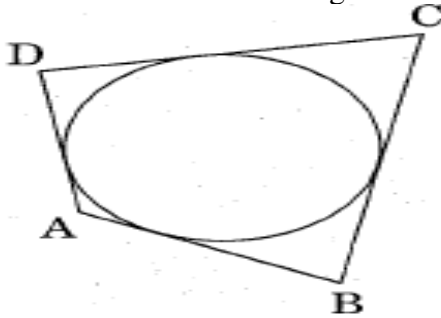


Figure 3

1.15. Draw a line segment AB of length 7cm. Using a ruler and compasses, Find a point P on AB such that $\frac{AP}{AB} = \frac{3}{5}$

1.16. Find the perimeter of shaded region in figure 4, if ABCD is a square of side 14cm and APB and CPD are semicircles

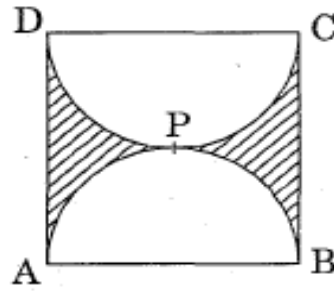


Figure 4

$(k-5)x^2 + 2(k-5)x + 2 = 0$ have equal roots

1.17. Two cubes each of volume 27 cm are joined end to end to form a solid. Find the surface area of the resulting cuboid.

OR

1.18. A cone of height 20 cm and radius of base 5 cm is made up of modelling clay. A child reshapes it in the form of a sphere. Find the diameter of the sphere.

1.19. Find the value of y for which the distance between the points $A(3, -1)$ and $B(11, y)$ is 10 units.

1.20. A ticket is drawn at random from a bag containing tickets numbered from 1 to 40. Find the probability that the selected ticket has a number which is a multiple of 5.

1.21. Find the roots of the following quadratic equation

$$x^2 - 3\sqrt{5}x + 10 = 0$$

1.22. Find an A.P. whose fourth term is 9 and the sum of its sixth term and thirteenth term is 40.

1.23. In Figure 5, a triangle PQR is drawn to circumscribe a circle of radius 6 cm such that the segments QT and TR into which QR is divided by the point of contact T, are of lengths 12 cm and 9 cm respectively. If the area of $\triangle PQR = 189\text{ cm}^2$, then find the lengths of sides PQ and PR.

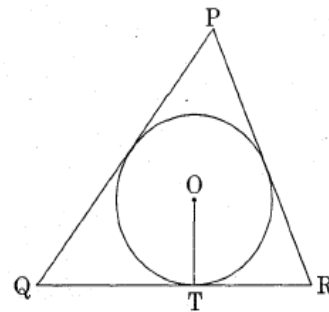


Figure 5

1.24. Draw a pair of tangents to a circle of radius

3 cm, which are inclined to each other at an angle of 60°

- 1.25. Draw a right triangle in which the sides other than hypotenuse) are of lengths 4 cm and 3 cm. Then construct another triangle whose sides are $\frac{3}{5}$ times the corresponding sides of the given triangle.

OR

- 1.26. A chord of a circle of radius 14 cm subtends an angle of 120° at the centre. Find the area of the corresponding minor segment of the circle. Use $\pi = \frac{22}{7}$ and $\sqrt{3} = 1.73$

- 1.27. An open metal bucket is in the shape of a frustum of a cone of height 21 cm with radii of its lower and upper ends as 10 cm and 20 cm respectively. Find the cost of milk which can completely fill the bucket at Rs. 30 per litre

- 1.28. Point P(x, 4) lies on the line segment joining the points A(-5, 8) and B(4, -10). Find the ratio in which point P divides the line segment AB. Also find the value of x.

- 1.29. Find the area of the quadrilateral ABCD, whose vertices are A(-3, -1), B(-2, -4), C(4, -1) and D(3, 4).

OR

- 1.30. Find the area of the quadrilateral ABCD, whose vertices are A(-3, -1), B(-2, -4), C(4, -1) and D(3, 4).

- 1.31. From the top of a vertical tower, the angles of depression of two cars, in the same straight line with the base of the tower, at an instant are found to be 45° and 60° . If the cars are 100 m apart and are on the same side of the tower, find the height of the tower. [Use $\sqrt{3} = 1.73$]

- 1.32. Two dice are rolled once. Find the probability of getting such numbers on the two dice, whose product is 12.

OR

- 1.33. A box contains 80 discs which are numbered from 1 to 80. If one disc is drawn at random from the box, find the probability that it bears a perfect square number.

- 1.34. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.

- 1.35. The first and the last terms of an A.P. are 8 and 350 respectively. If its common difference

is 9, how many terms are there and what is their sum ?

OR

- 1.36. How many multiples of 4 lie between 10 and 250 ? Also find their sum.

- 1.37. A train travels 180 km at a uniform speed. If the speed had been 9 km/hour more, it would have taken 1 hour less for the same journey. Find the speed of the train.

OR

- 1.38. Find the roots of the equation $\frac{1}{2x-3} + \frac{1}{x-5} = 1$, $x \neq \frac{3}{2}, 5$

- 1.39. In Figure 6, three circles each of radius 3.5 cm are drawn in such a way that each of them touches the other two. Find the area enclosed between these three circles (shaded region). Use $\pi = \frac{22}{7}$

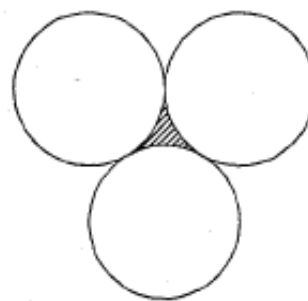


Figure 6

- 1.40. Water is flowing at the rate of 15 km/hour through a pipe of diameter 14 cm into a cuboidal pond which is 50 m long and 44 m wide. In what time will the level of water in the pond rise by 21 cm ?

- 1.41. The angle of elevation of the top of a vertical tower from a point on the ground is 60° . From another point 10 m vertically above the first, its angle of elevation is 30° . Find the height of the tower.