

Most Important Questions(Mathematics)

Class 10 CBSE Board 2021-22(Term II)

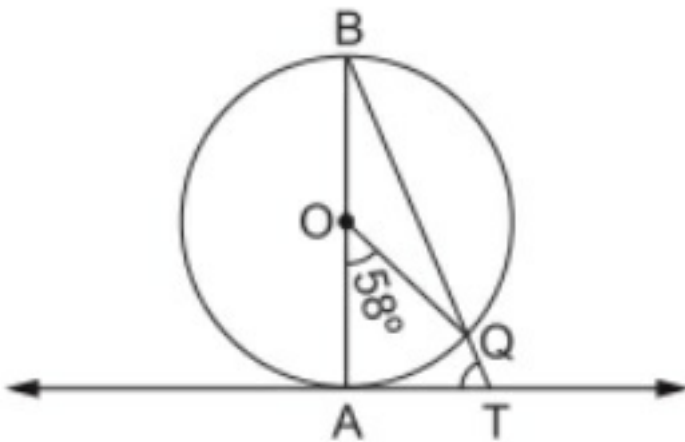
1. A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that $OQ = 13$ cm. Find the length of PQ

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2. From a point P , 10 cm away from the centre of a circle, a tangent PT of length 8 cm is drawn. Find the radius of the circle.

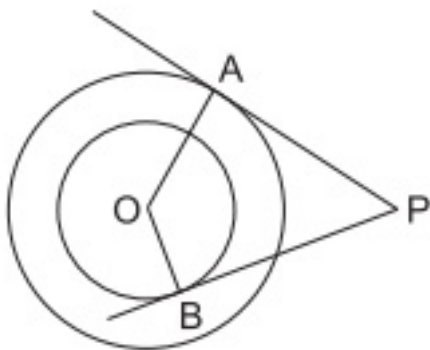
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3. In the given figure, AB is the diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 58^\circ$, find $\angle ATQ$.(in degree)



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4. Tangents PA and PB are drawn from an external point P to two concentric circles with centre O and radii 8 cm and 5 cm respectively, as shown in the figure. If $AP = 15$ cm then find the length of BP

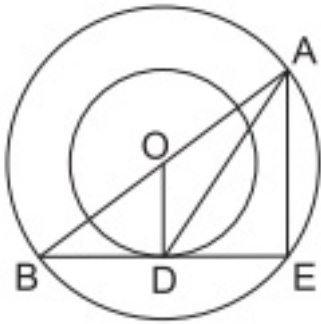


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5. Two concentric circles are of radii 7 cm and r cm respectively, where $r > 7$. A chord of the larger circle of length 46 cm, touches the smaller circle. Find the value of $\frac{r}{\sqrt{2}}$.

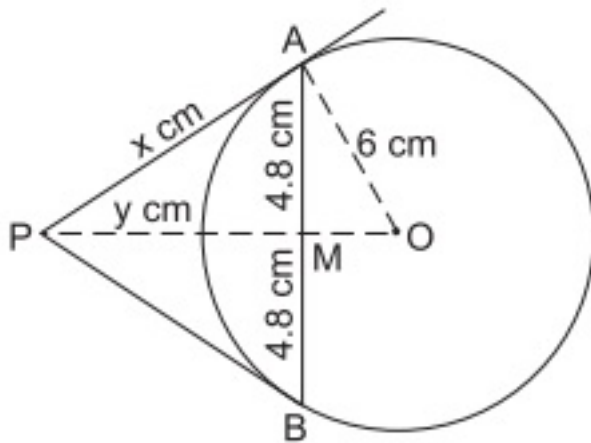
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6. In the given figure, the radii of two concentric circles are 13 cm and 8 cm. AB is a diameter of the bigger circle and BD is a tangent to the smaller circle touching it at D . Find the length of AD in cm.



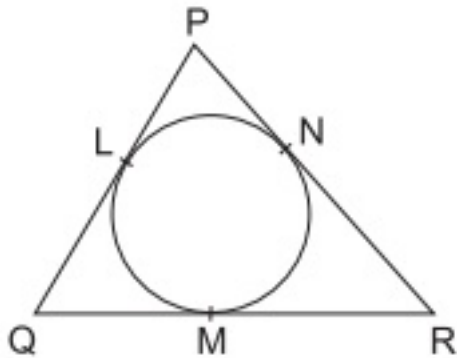
7. In the given figure, AB is a chord of length 9.6 cm of a circle with centre O and radius 6 cm. The tangents at A and B intersect at P . Find the length of PA .

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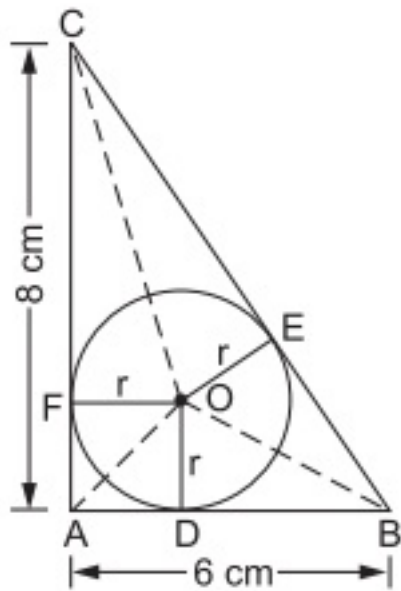
8. In the given figure, a circle is inscribed in a triangle PQR . If $PQ = 10$ cm, $QR = 8$ cm and $PR = 12$ cm, find the lengths of $QM + RM$.

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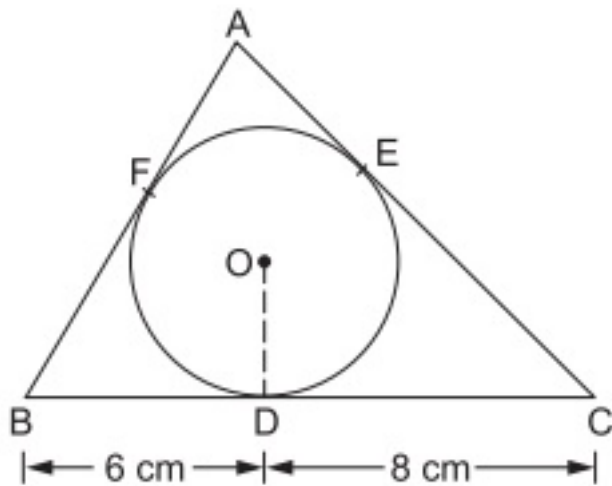
9. In the given figure, ABC is a right-angled triangle with $AB = 6$ cm and $AC = 8$ cm. A circle with centre O has been inscribed inside the triangle. Calculate the value of r , the radius of the inscribed circle.

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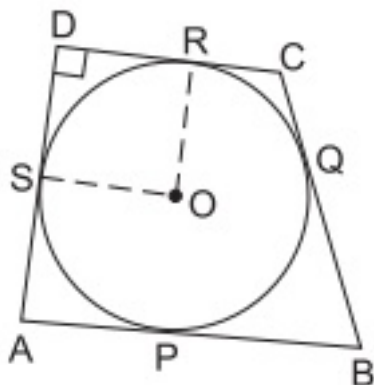
10. In the given figure, a triangle ABC is drawn to circumscribe a circle of radius 3 cm, such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 6 cm and 8 cm respectively. Find the side AB , if the area of $\triangle ABC$ is 63 cm^2 .

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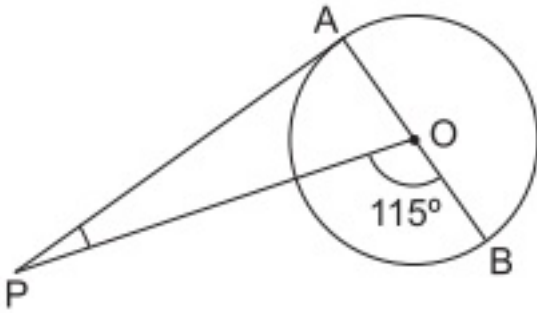
11. In the given figure, $ABCD$ is a quadrilateral such that $\angle D = 90^\circ$. A circle with centre O and radius r , touches the sides AB, BC, CD and DA at P, Q, R and S respectively. If $BC = 40 \text{ cm}$, $CD = 25 \text{ cm}$ and $BP = 28 \text{ cm}$, find r .

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12. In the given figure, PA is a tangent from an external point P to a circle with centre O . If $\angle POB = 115^\circ$, find $\angle APO$ (in degree)

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13. A vertical pole stands on the level ground. From a point on the ground, 25 m away from the foot of the pole, the angle of elevation of its top is found to be 60° . Find the height of the pole. [Take $\sqrt{3} = 1.732$.]
14. A kite is flying, attached to a thread which is 165 m long. The thread makes an angle of 30° with the ground. Find the height of the kite from the ground, assuming that there is no slack in the thread.
15. The length of a string between a kite and a point on the ground is 85 m. If the string makes an angle θ with the ground level such that $\tan \theta = 15/8$ then find the height of the kite from the ground. Assume that there is no slack in the string.
16. A ladder 15 m long just reaches the top of a vertical wall. If the ladder makes an angle of 60° with the wall, find the height of the wall.
17. If a tower 30 m high, casts a shadow $10\sqrt{3}$ m long on the ground, then what is the angle of elevation of the sun? (in degree)
18. If a 1.5m tall girl stands at a distance of 3 m from a lamp-post and casts a shadow of length 4.5 m on the ground then find the height of the lamp-post. (in metres)
19. A tower is 50 m high. Its shadow is x metres shorter when the sun's altitude is 45° than when it is 30° . Find the value of x . [Given $\sqrt{3} = 1.732$.]
20. Two ships are approaching a lighthouse from opposite directions. The angles of depression of the two ships from the top of a lighthouse are 30° and 45° . If the distance between the two ships is 100 metres, find the height of the lighthouse. (in metres)(Use $\sqrt{3} = 1.732$.)
21. An aeroplane when flying at a height of 3000 metres from the ground passes vertically above another aeroplane at an instant when the angles of elevation of the two planes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the aeroplanes at that instant. [Take $\sqrt{3} = 1.73$.]
22. A person standing on the bank of a river observes that the angle of elevation of the top of a tree standing on the opposite bank is 60° . When he moves 30 metres away from the bank, he finds the angle of elevation to be 30° . Find the width of the river.(in metres) [Take $\sqrt{3} = 1.732$.]
23. A boy standing on a horizontal plane finds a bird flying at a distance of 100m from him at an

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elevation of 30° . A girl standing on the roof of a 20m high building, finds the angle of elevation of the same bird to be 45° . The boy and the girl are on the opposite sides of the bird. Find the distance of the bird from the girl.(in metres) [Given $\sqrt{2} = 1.41$.]

24. A 1.5m tall boy is standing at some distance from a 30m tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. Find the distance he walked towards the building.(in metres) [Ask Filo](#)
25. A kite is flying at a height of 75 m from the level ground, attached to a string inclined at 60° to the horizontal. Find the length of the string, assuming that there is no slack in it. (in metres)[Take $\sqrt{3} = 1.732$.] [Ask Filo](#)
26. Find the 16th term of the AP 3, 5, 7, 9, 11, [Ask Filo](#)
27. Find the negative of 12th term of the AP 14, 9, 4, -1, -6, [Ask Filo](#)
28. Find the 105 th term of the AP $4, 4\frac{1}{2}, 5, 5\frac{1}{2}, 6, \dots$ [Ask Filo](#)
29. Find the 25th term of the AP $-5, \frac{-5}{2}, 0, \frac{5}{2}, \dots$ [Ask Filo](#)
30. If the nth term of an AP is $(5n - 2)$, find its first term. [Ask Filo](#)
31. If the n^{th} term of an AP is $(5n - 2)$, find its common difference [Ask Filo](#)
32. Which term of the AP 3, 15, 27, 39, . . . will be 120 more than its 21st term? [Ask Filo](#)
33. How many three-digit numbers are divisible by 7? [Ask Filo](#)
34. The first and the last terms of an AP are 7 and 49 respectively. If sum of all its terms is 420 , find its common difference. [Ask Filo](#)
35. Find the sum of all multiples of 7 lying between 500 and 900 . [Ask Filo](#)
36. The total cost of a certain length of a piece of wire is ₹200. If the piece was 5 metres longer and each metre of wire costs ₹2 less, the cost of the piece would have remained unchanged. How long is the piece and what is its original rate per metre? [Ask Filo](#)
37. If a man walks 1 km/hr faster than his usual speed then he covers a distance of 3 km in 15 minutes less time. Find his usual speed.(in km/hr) [Ask Filo](#)

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Compute the arithmetic mean for the following data:

38.

Marks obtained	Number of students
Less than 10	14
Less than 20	22
Less than 30	37
Less than 40	58
Less than 50	67
Less than 60	75

39. Find the missing frequencies in the following frequency f_1 distribution table, if $N = 100$ and median is 32 .

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Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	Total
Number of students	10	f_1	25	30	f_2	10	100

40. The following table shows the marks obtained by 100 students of Class X in a school during a particular academic session. Find the mode of this distribution.

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Marks	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80
Number of students	7	21	34	46	66	77	92	100

41. Three cubes each of volume 216 cm^3 are joined end to end to form a cuboid. Find the total surface area of the resulting cuboid.(in cm^2)

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42. A sphere and a cube have equal surface areas. Then find $\sqrt{\pi} \times$ (the ratio of the volume of sphere to that of the cube)

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43. A vessel is in the form of a hemispherical bowl mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the capacity of the vessel.(in cm^3)

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44. A solid is composed of a cylinder with hemispherical ends. If the whole length of the solid is 104 cm and the radius of each of its hemispherical ends is 7 cm, find the cost of polishing its surface at the rate of ₹10 per dm^2 .(in rupees)

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45. The dimensions of a metallic cuboid are $100 \text{ cm} \times 80 \text{ cm} \times 64 \text{ cm}$. It is melted and recast into a cube. Find the surface area of the cube.(in cm^2)

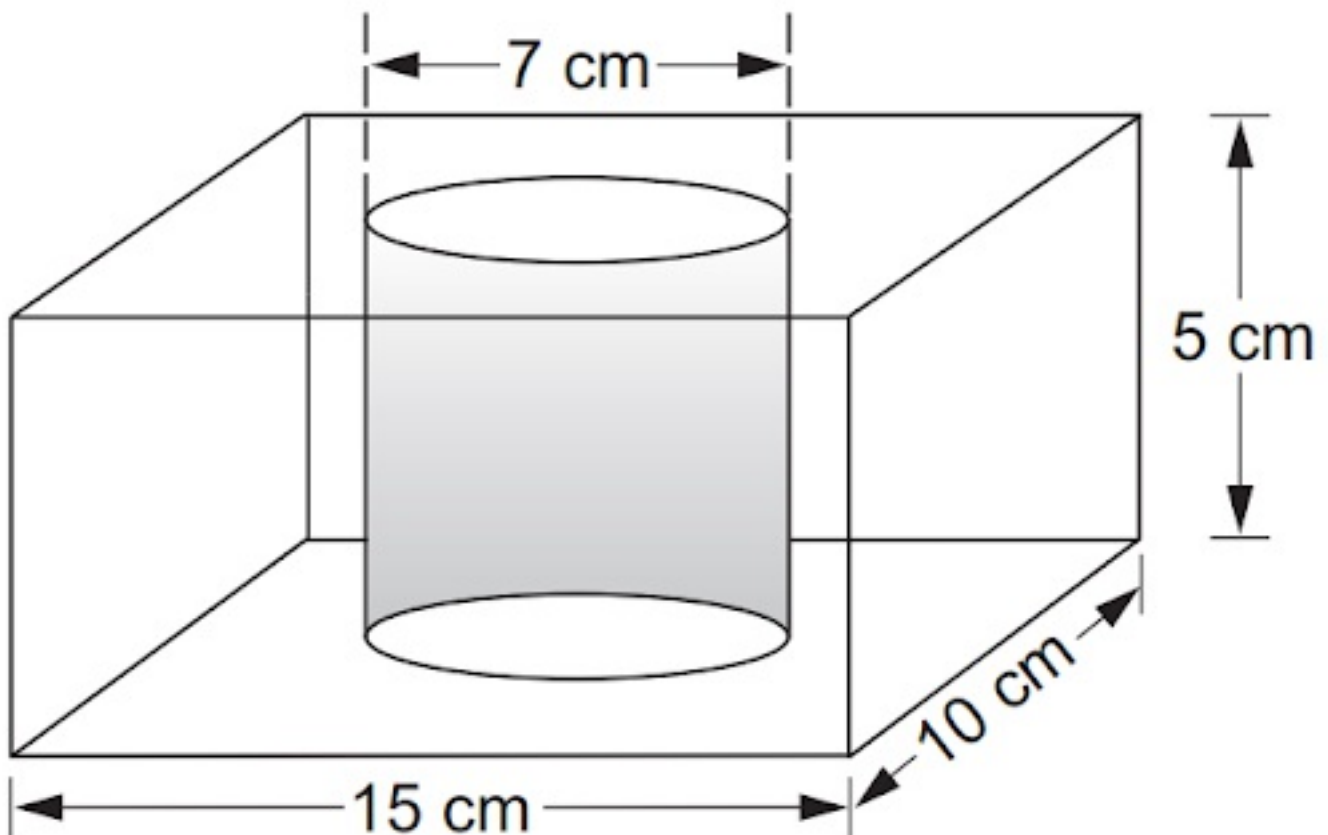
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46. A spherical glass vessel has a cylindrical neck 8 cm long, 2 cm in diameter; the diameter of the spherical part is 8.5 cm. By measuring the amount of water it holds, Radhika finds its volume to be 345 cm^3 . Check mathematically whether she is correct by finding the volume of vessel, taking the above as the inside measurements and $\pi = 3.14$. [Ask Filo](#)

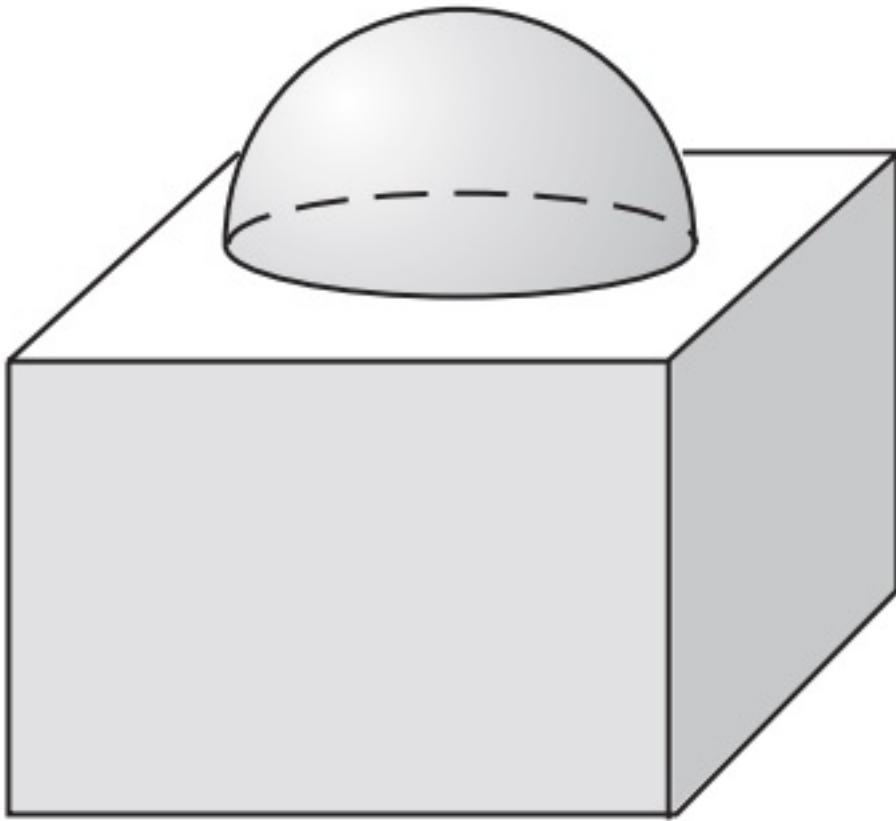
47. From a solid right circular cylinder with height 12 cm and radius of the base 5 cm, a right circular cone of the same height and the same base radius is removed. Find the total surface area of the remaining solid. (in cm^2) [Use $\pi = 3.14$.] [Ask Filo](#)

48. A hemispherical depression is cut out from one face of a cubical block of side 7 cm, such that the diameter of the hemisphere is equal to the edge of the cube. Find the surface area of the remaining solid. (in cm^2) [Ask Filo](#)

49. In the given figure, from a cuboidal solid metallic block of dimensions $15 \text{ cm} \times 10 \text{ cm} \times 5 \text{ cm}$, a cylindrical hole of diameter 7 cm is drilled out. Find the surface area of the remaining block. (in cm^2) [Ask Filo](#)



50. A solid is made up of a cube and a hemisphere attached on its top, as shown in the figure. Each edge of the cube measures 5 cm and the hemisphere has a diameter of 4.2 cm. Find the total area to be painted. (in cm^2) [Take $\pi = 22/7$.] [Ask Filo](#)



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