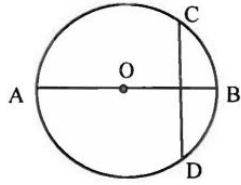


SATPREP

Assignment : Circles

Easy



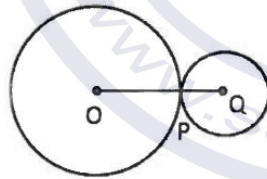
1. The figure above shows a circle with center O. Lines AB and CD are perpendicular and AB passes through point O. If the length of AB is 10 and length of CD is 8, what is the distance of O to line CD?

- a) 2
- b) 3
- c) 4
- d) 5

2. The diameter of a semi-circle is 4. What is its perimeter?

- a) $2\pi + 2$
- b) $2\pi + 4$
- c) $2\pi + 6$
- d) $\pi + 2$

3. In the figure below, the two circles are tangent at point P and $OQ = 9$. If the area of the circle with center O is four times the area of the circle with center Q, what is the length of OP?

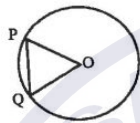


- a) 2
- b) 4
- c) 6
- d) 8

4. A chord of a circle is 2 inches away from the center of the circle at its closest point. If the circle has a 3-inch radius, what is the length of this chord, in inches?

- a) 1
- b) $\sqrt{5}$
- c) 2
- d) $2\sqrt{5}$

5. Point O is the center of the circle in the figure below. If angle $\angle PQO = 65^\circ$, what is the measure of the center angle $\angle POQ$?



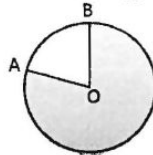
- a) 40°
- b) 50°
- c) 60°
- d) 70°



6. In the figure above, the circle has a center O and radius of 3 ft. What is the area of the shaded portion, in square feet?

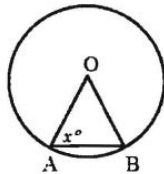
- a) $\frac{3}{4}\pi$
- b) $\frac{9}{8}\pi$
- c) $\frac{11}{8}\pi$
- d) 1.5π

7. In the figure below, circle O is composed of a shaded region and an un-shaded region. If the area of the shaded region is 80π and the radius of the circle is 10, what is the length of arc AB (un-shaded region)?

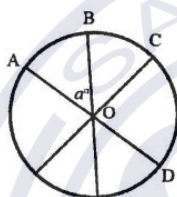


- a) 2π
- b) 4π
- c) 6π
- d) 8π

8. In the figure below, points A and B lie on circle O. If $\angle AOB = y^\circ$, what is the value of x in term of y ?

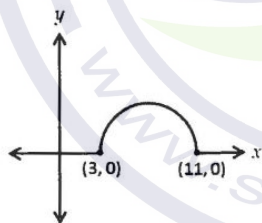


- a) y
- b) $90 - y$
- c) $180 - y$
- d) $90 - \frac{1}{2}y$



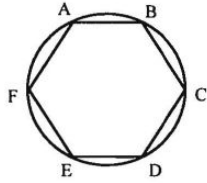
Note: Figure not drawn to scale.

9. In the figure above, O is the center of the circle, $\widehat{AB} = \widehat{BC}$, and $\widehat{AC} = \widehat{CD}$. What is the value of a , in degrees?

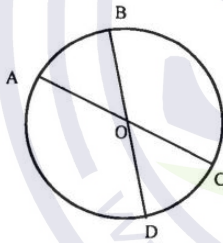


10. In the figure above, what is the sum of the x and y coordinates of the highest point on the above semicircle?
- a) 6
 - b) 8
 - c) 9
 - d) 11

11. In the circle below, Hexagon ABCDEF is equilateral. What is the ratio of the length of arc ABCD to the length of arc AFE?



- a) 1 to 2
 b) 2 to 3
 c) 3 to 2
 d) 4 to 5
12. The area of circle A is 9 times the area of circle B. What is the ratio of the diameter of circle A to the diameter of circle B?
- a) 9 : 1
 b) 6 : 1
 c) 3 : 1
 d) 3 : 2



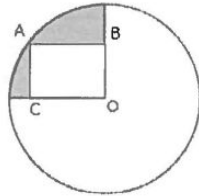
13. In the figure above, point O is the center of the circle and segments BD and AC are diameters. If $\overline{OA} = 5$ and $m\angle AOB < 60^\circ$. Which of the following statements is true?
- a) $\overline{OC} = 5$
 b) $\overline{CD} > 5$
 c) $\overline{OD} < 5$
 d) $\overline{CD} = 5$
14. What is the difference, in degrees, between an arc that is $\frac{3}{8}$ of a circle and an arc that is $\frac{1}{3}$ of a circle?
- a) 20°
 b) 18°
 c) 15°
 d) 12°

15. Segment \overline{AB} is the diameter of a circle with center O . Another point C lies on circle O . If $AC = 6$ and $BC = 8$, what is the area of circle O ?
- a) 25π
 - b) 50π
 - c) 100π
 - d) 200π
16. One circle has a radius of 3 and another circle has a radius of 2. What is the ratio of the area of the larger circle to the area of the smaller circle?
- a) 3 : 2
 - b) 9 : 4
 - c) 3 : 1
 - d) 4 : 1

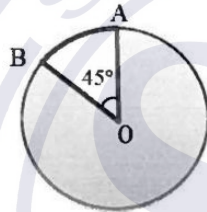
Medium

17. A circle with center at coordinates $(4, 5)$ touches the y -axis at only one point. What is the radius of the circle?
18. An old clock has 2 different sizes of gears. The area of the bigger gear is 4 times the area of the smaller gear. The gears are attached so they must move together. How many revolutions must the smaller gear make for each revolution of the bigger gear?

19. In the figure below, rectangle ABOC is drawn in circle O. If $OB = 3$ and $OC = 4$, what is the area of the shaded region?

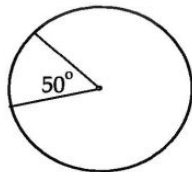


- a) $6\pi - 3$
 b) $\frac{25\pi}{4} - 12$
 c) $25\pi - 12$
 d) $\frac{25\pi}{4} - 3$

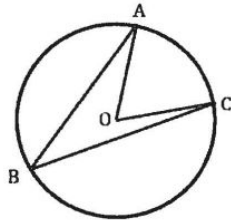


20. The circle above has an area of 16π . What is the perimeter of the shaded region?

- a) $8 - \frac{1}{3}\pi$
 b) $8 + 7\pi$
 c) $8 + \frac{2}{3}\pi$
 d) $8 + \frac{1}{3}\pi$



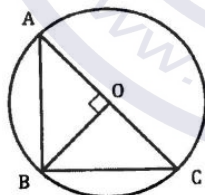
21. In the figure above, a piece with a 50° center angle has been cut out of an 18-ounce pie. How many ounces was the piece of pie that was cut out?



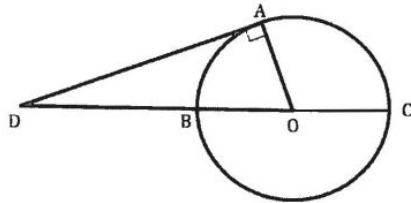
22. In the figure above, if \widehat{AC} has arc length equal to $\frac{1}{6}$ of the circumference of the circle, what is the value of $m\angle ABC$, in degrees?



23. In the figure above, O is the center of the two circles. If the bigger circle has a radius of 5 and the smaller circle has a radius of 4, what is the area of shaded region?
- 2π
 - π
 - $\frac{9}{8}\pi$
 - $\frac{1}{2}\pi$



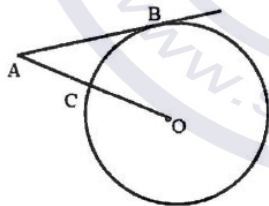
24. In the figure above, a circle O with diameter \overline{AC} has an area of 16π . What is the length of segment \overline{AB} ?
- 4
 - 6
 - $6\sqrt{2}$
 - $4\sqrt{2}$



25. Point O is the center of the circle in the figure above. If $DA = 12$ and $DB = 8$, what is the area of the circle?

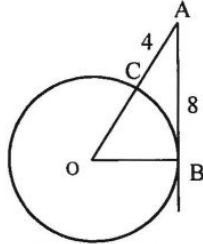
Hard

26. Circle A has an area of 4π and circle B has an area of 9π . If the circles intersect at only one point, what is the sum of all possible distances from the center of circle A to the center of circle B?

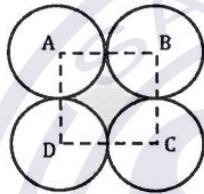


27. In the diagram above, AB is tangent to circle O at point B. $AB = 2AC$ and the radius has length 3. What is the length of \overline{AO} ?

28. In the figure below, AB is tangent to circle O , $\overline{AB} = 8$, and $\overline{AC} = 4$. What is the area of $\triangle OAB$?



Note: Figure not drawn to scale.

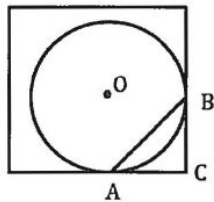


29. The figure above consists of four congruent, tangent circles with radius 1. What is the area of the shaded region?

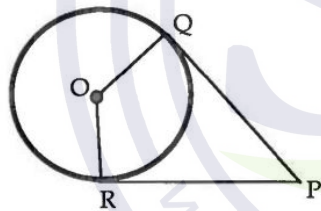


30. The figure above consists of three circles that share the same center. The circles have radii of 2, 3, and 4 respectively. What is the probability that a randomly chosen point will be in the shaded region?
- $\frac{3}{16}$
 - $\frac{1}{4\pi}$
 - $\frac{5}{16}$
 - $\frac{7}{16}$

31. In the figure below, circle O is tangent to a square at points A and B . If the area of $\triangle ABC$ is 8, what is the area of the circle?



- a) 4π
 b) 6π
 c) $6\pi\sqrt{2}$
 d) 16π
32. In the figure below, point O is the center of the circle, line segments PQ and PR are tangent to the circle at points Q and R , respectively, and the segments intersect at point P as shown. If the radius of the circle is 6 and the length of PQ is $6\sqrt{3}$, what is the area of minor sector \widehat{RQ} ?



33. Find the radius of the circle given by the equation $x^2 + y^2 + 4x + 4y - 1 = 0$.

34. Find the area of the circle given by the equation $x^2 + y^2 + 4x + 4y - 1 = 0$. (Round your answer to the nearest tenth.)