

Circles: math practice, Grade 10 – download the PDF

23 problems graded by difficulty (★ easy, ★★ medium, ★★★ hard). Try first, without looking at the solutions!

1 Parts of a circle

★ ★ ★

A circular trampoline has a diameter of **14** ft. (a) What is its radius? (b) What is the length of the longest chord of the trampoline? (c) A line touches the edge at exactly one point. What is this line called?

2 A tangent and a radius

★ ★ ★

The line ***PT*** is tangent to a circle with center ***O*** at ***T***. The radius is ***OT* = 7** cm and ***OP* = 25** cm. Find ***PT***.

3 Central and inscribed angle

★ ★ ★

A central angle **$\angle AOB$** measures **112°** . (a) What is the measure of arc ***AB***? (b) What is the measure of an inscribed angle that intercepts this same arc?

4 Angle in a semicircle



$\overline{AB}$ is a diameter of a circle and C is another point on the circle. If $m\angle A = 37^\circ$, find $m\angle C$ and $m\angle B$ in triangle ABC .

5 Length of an arc



A circle has radius 6 cm. Find the length of a 60° arc. Give the exact value and a decimal rounded to the nearest hundredth.

6 Area of a sector



A sprinkler waters a quarter circle (a 90° sector) of lawn. Its reach is 10 ft. What area of lawn does it water?

7 Writing an equation



Write the equation of the circle with center $(-1, 4)$ and radius 3. Then decide whether the point $(2, 4)$ lies on it.

8 Distance to a chord



A circle has radius 13 in. A chord of length 24 in is drawn. How far is the chord from the center of the circle?

9 Two tangent segments



From a point P outside a circle, tangent segments PA and PB are drawn to points A and B on the circle. $PA = 3x + 2$ and $PB = 5x - 10$. Find x and the length of each segment.

10 Triangle inscribed in a circle



Triangle ABC is inscribed in a circle. The arcs it cuts off measure $\widehat{AB} = 100^\circ$, $\widehat{BC} = 130^\circ$, and $\widehat{CA} = 130^\circ$. Find the three angles of the triangle and check that they add up to 180° .

11 Pizza slices



A 16-inch pizza (diameter) is cut into 8 equal slices. Find (a) the area of one slice and (b) the length of its curved crust edge. Round to the nearest tenth.

12 Angles from secants and tangents



(a) Two secants meet outside a circle and intercept a far arc of 110° and a near arc of 40° . Find the angle at the vertex. (b) A tangent and a chord meet at a point on the circle and intercept an arc of 148° . Find the angle between them.

13 Intersecting chords



Chords AB and CD meet at E inside a circle. $AE = 6$, $EB = 4$, and $CE = 3$. Find ED .

14 Circle from a diameter



The segment joining $A(-2, 3)$ and $B(6, 9)$ is a diameter of a circle. Find the center, the radius, and the equation of the circle.

15 Ferris wheel



A Ferris wheel has a radius of 30 ft. A rider turns through 150° from the loading platform. How far did the rider travel along the circle? Give the answer in feet and in meters ($1 \text{ ft} \approx 0.3048 \text{ m}$), rounded to the nearest tenth.

16 Completing the square

★★★

Show that $x^2 + y^2 + 8x - 10y + 16 = 0$ is the equation of a circle. Find its center and radius.

17 Tangent line to a circle

★★★

The circle $x^2 + y^2 = 25$ passes through $T(3, 4)$. Find an equation of the tangent line to the circle at T .

18 Circle through three points

★★★

Find the equation of the circle that passes through $O(0, 0)$, $A(8, 0)$, and $B(0, 6)$.

19 Circles of a right triangle

★★★

A right triangle has legs **9** cm and **12** cm. Find the radius R of its circumscribed circle and the radius r of its inscribed circle.

20 The reef problem

★★★

A circular reef is surrounded by open water. From a dock at point P , a straight path just touches the edge of the reef; this path is **30** m long. A second straight path from P enters the reef at a point **20** m from the dock and goes straight through it. How long is this second path inside the reef?

21 Area of a segment

★★★

In a circle of radius **8** cm, a chord AB makes a central angle of **90°** . Find the area of the region between the chord and the minor arc. Round to the nearest tenth.

22 Cyclic quadrilateral



Quadrilateral $ABCD$ is inscribed in a circle. $m\angle A = (2x + 10)^\circ$ and $m\angle C = (4x - 40)^\circ$. Also $m\angle B = (3y + 5)^\circ$ and $m\angle D = (5y - 65)^\circ$. Find all four angles.

23 Hexagon in a circle



A regular hexagon is inscribed in a circle of radius **10** in. Find the area of the part of the disk outside the hexagon. Round to the nearest tenth.



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