

Geometry - Circles: Angles, Chords and Tangents - Worksheet

Common Core G-C.A.1, G-C.A.2, G-C.A.3, G-C.A.4 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

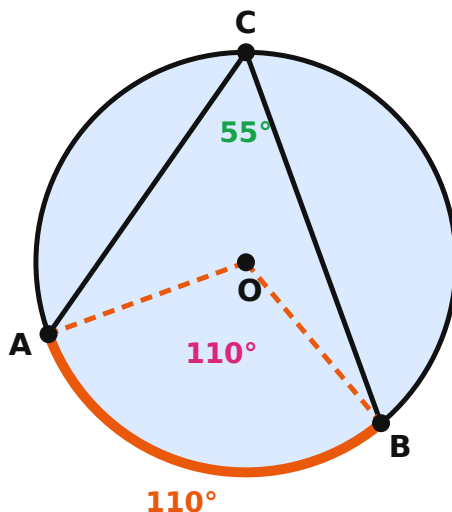
These 20 problems practice central angles, inscribed angles, tangents, chords and circles of triangles (Common Core G-C.A.1 to G-C.A.4). The first problems are quick one-step checks of the definitions and formulas from the lesson. The middle problems ask for diagrams, equations and careful reasoning in the style of a high school Geometry class. The last six problems are applications with wheels, ponds and coordinates of circles.

Geometry · Common Core State Standards: **G-C.A.1, G-C.A.2, G-C.A.3, G-C.A.4**

Exercise 1 - Central angle

A central angle of a circle intercepts an arc of 72° . Find the measure of the central angle.

Exercise 2 - Inscribed angle



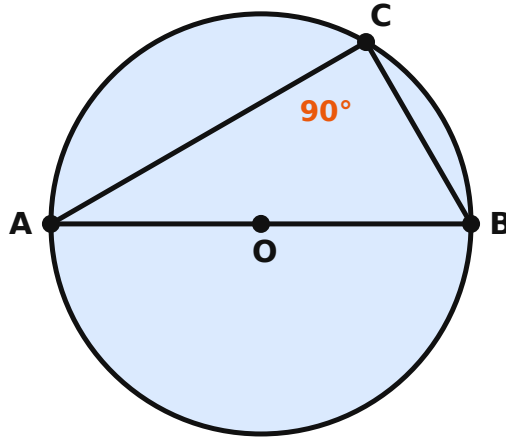
An inscribed angle is half of its intercepted arc: $110/2 = 55$.

An inscribed angle intercepts an arc of 110° . Find the measure of the inscribed angle.

Exercise 3 - Find the arc

An inscribed angle measures 47° . Find the measure of the arc it intercepts.

Exercise 4 - Angle in a semicircle



An angle inscribed in a semicircle is a right angle.

AB is a diameter of the circle and C is on the circle. If $m\angle A = 35^\circ$, find $m\angle B$.

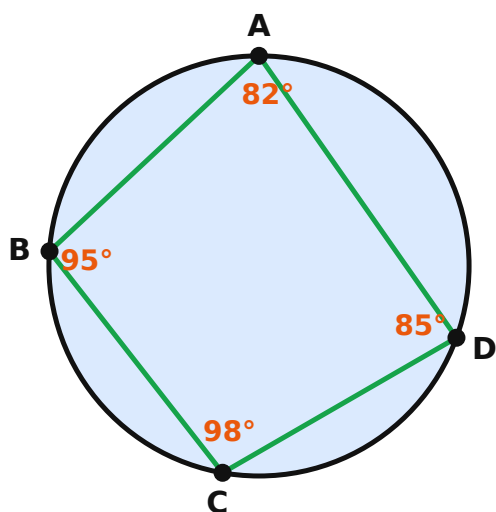
Exercise 5 - Same arc, same angle

Two inscribed angles intercept the same arc. Their measures are $(3x+5)^\circ$ and $(5x-15)^\circ$. Find x and the angle measure.

Exercise 6 - Central and inscribed

A central angle measures $(4x-30)^\circ$ and an inscribed angle on the same arc measures $(x+20)^\circ$. Find x and both angles.

Exercise 7 - Inscribed quadrilateral



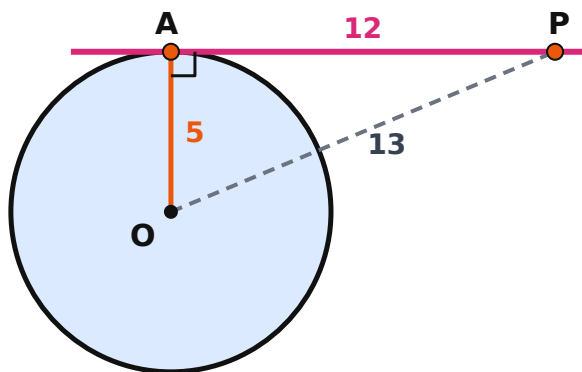
Opposite angles of an inscribed quadrilateral are supplementary.

Quadrilateral ABCD is inscribed in a circle. $m\angle A = 82^\circ$ and $m\angle B = 95^\circ$. Find $m\angle C$ and $m\angle D$.

Exercise 8 - Inscribed quadrilateral algebra

In an inscribed quadrilateral, $m\angle A = (3x+7)^\circ$ and the opposite angle $m\angle C = (5x-27)^\circ$. Find x and both angles.

Exercise 9 - Tangent and distance



A tangent is perpendicular to the radius at the point of tangency.

A circle has radius 5. From an outside point P, a tangent segment PA has length 12. Find the distance OP from the center to P.

Exercise 10 - Equal tangent segments

Tangent segments PA and PB are drawn to a circle from point P. $PA = 3x + 4$ and $PB = 5x - 10$. Find x and PA.

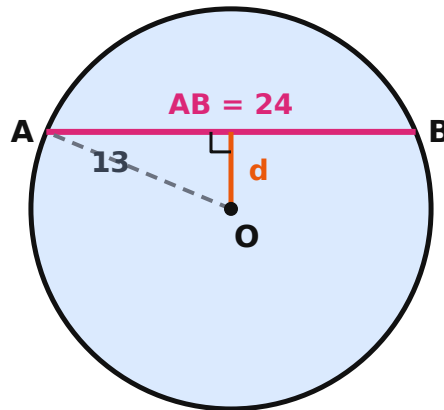
Exercise 11 - Tangent and radius angle

PA is tangent to a circle with center O at A. $m\angle ACP = 64^\circ$. Find $m\angle APO$.

Exercise 12 - Chord from a central angle

A circle has radius 10. A chord subtends a central angle of 60° . Find the length of the chord.

Exercise 13 - Distance to a chord



Chord AB = 24 in a circle of radius 13.

A circle has radius 13 and a chord of length 24. Find the distance d from the center to the chord.

Exercise 14 - Arcs add to 360

Four arcs of a circle measure 80° , 95° , 110° and x . Find x.

Exercise 15 - Tangent-chord angle

A tangent and a chord meet at a point on a circle. The angle between them is half of the intercepted arc. Find the angle if the arc is 130° .

Exercise 16 - Chords crossing inside

Two chords cross inside a circle. The angle formed measures half the sum of the arcs it and its vertical angle intercept. Find the angle if those arcs are 70° and 50° .

Exercise 17 - Circles of a triangle

A right triangle has legs 6 and 8 and hypotenuse 10. Find the radius of its circumscribed circle (the hypotenuse is a diameter) and the radius of its inscribed circle, which is $\frac{a+b-c}{2}$.

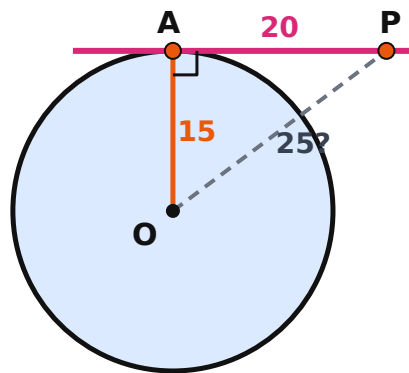
Exercise 18 - All circles are similar

Circle A has radius 3 and circle B has radius 8. Find the scale factor of the dilation that maps A to B, the ratio of their circumferences and the ratio of their areas.

Exercise 19 - Ferris wheel

A Ferris wheel has radius 20 feet and 8 cars equally spaced around the rim. Find the central angle between neighboring cars and the straight-line distance between neighboring cars to the nearest tenth.

Exercise 20 - Round pond



Path PA is tangent to the pond.

A walking path from point P touches a circular pond at A and is tangent to it. The pond has radius 15 feet and PA is 20 feet. How far is P from the center of the pond?