

Geometry · Circles: Chords, Arcs and Inscribed Angles · Worksheet

Common Core G-C.A.1, G-C.A.2 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

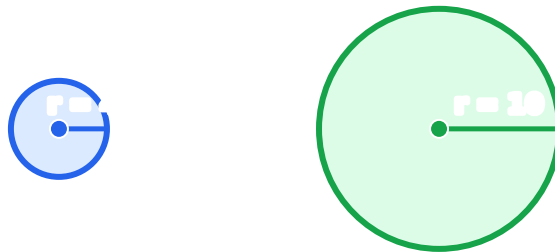
These 24 problems practice circle theorems for Geometry, aligned to G-C.A.1 and G-C.A.2. They start with similar circles, central angles and inscribed angles, then move to semicircles, tangents and chords.

Later problems use inscribed quadrilaterals and algebra to find unknown angles and arcs. The last six are word problems and multi-step tasks set in plazas, ponds and amusement parks.

GeometryCommon Core: G-C.A.1 · G-C.A.2

Problem 1: Similar circles

Circle A has radius 4 cm and circle B has radius 10 cm. (a) Describe a translation and a dilation that map circle A onto circle B and give the scale factor. (b) Find the ratio of the circumference of B to the circumference of A.



Circle A has radius 4 and circle B has radius 10.

Problem 2: Ratio of circumferences

Circle P has radius 3 inches and circle Q has radius 12 inches. Find both circumferences in terms of π and the ratio of the circumference of Q to that of P.

Problem 3: Central angle and arc

In circle O , central angle $\angle AOB$ measures 72° . Find the measure of minor arc AB and of major arc AB .

Problem 4: Inscribed angle from an arc

Inscribed angle $\angle ACB$ intercepts arc AB that measures 110° . Find $m\angle ACB$.

Problem 5: Arc from an inscribed angle

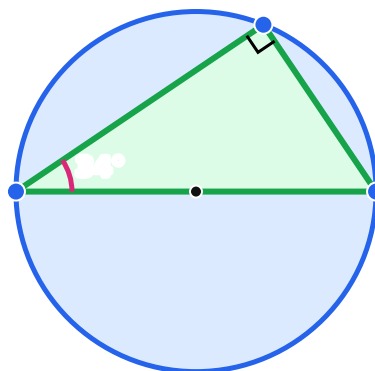
An inscribed angle measures 38° . Find its intercepted arc and the central angle that intercepts the same arc.

Problem 6: Inscribed angle algebra

Inscribed angle $\angle ABC$ measures $(3x+5)^\circ$ and it intercepts an arc of $(8x-10)^\circ$. Find x , the angle, and the arc.

Problem 7: Triangle in a semicircle

Segment $\overline{AB}$ is a diameter and C is on the circle. If $\angle A = 34^\circ$, find $\angle ACB$ and $\angle B$.



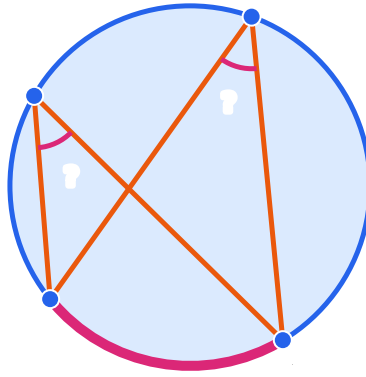
AB is a diameter.

Problem 8: Semicircle algebra

Segment $\overline{AB}$ is a diameter of a circle and C is another point on the circle.
 $m\angle CAB = (2x+4)^\circ$ and $m\angle CBA = (3x+6)^\circ$. Find x and both angles.

Problem 9: Angles on the same arc

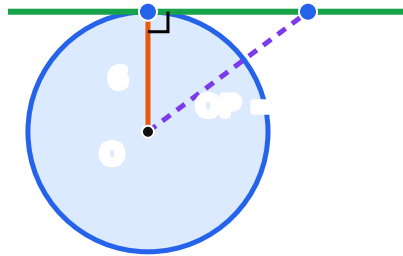
Arc AB measures 82° . Points C and D lie on the major arc. Find $m\angle ACB$ and $m\angle ADB$.



Arc AB measures 82° .

Problem 10: Radius and tangent

Line AP is tangent to the circle at A . The radius OA is 6 and AP is 8. Find OP .



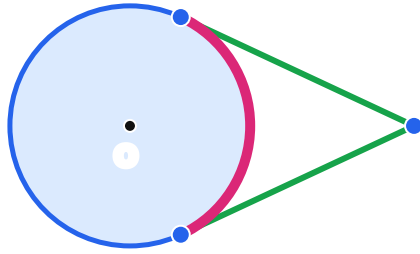
Line AP is tangent to the circle at A .

Problem 11: Angle at a tangent

Line ℓ is tangent to a circle with center O at point A , and P is another point on ℓ . If $m\angle AOP = 52^\circ$, find $m\angle APO$.

Problem 12: Two tangents

Tangent segments PA and PB touch a circle with center O at A and B . Minor arc AB measures 130° . Find $m\angle AOB$ and $m\angle APB$.



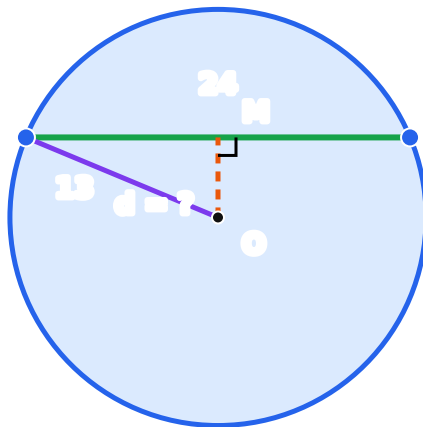
Minor arc AB measures 130° .

Problem 13: Equal tangent segments

From point P outside a circle with center O , tangent segments PA and PB are drawn. The radius is 5 and $OP = 13$. Find PA and PB .

Problem 14: Distance to a chord

A chord of length 24 is drawn in a circle of radius 13. Find the distance from the center to the chord.



A chord and the perpendicular from the center.

Problem 15: Chord from a distance

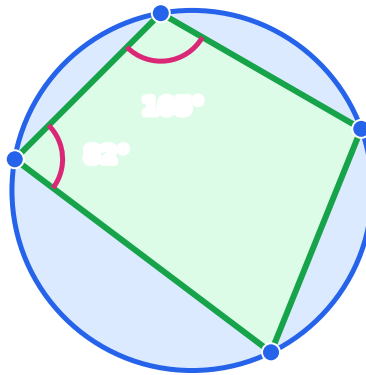
A chord is 8 units from the center of a circle with radius 17. Find the length of the chord.

Problem 16: Equal chords

Chords AB and CD of the same circle have equal length. Arc AB measures $(4x+6)^\circ$ and arc CD measures $(6x-14)^\circ$. Find x and the arc measures.

Problem 17: Inscribed quadrilateral

Quadrilateral $ABCD$ is inscribed in a circle. $m\angle A = 105^\circ$ and $m\angle B = 82^\circ$. Find $m\angle C$ and $m\angle D$.



Quadrilateral $ABCD$ is inscribed in a circle.

Problem 18: Inscribed quadrilateral algebra

In an inscribed quadrilateral $ABCD$, $m\angle A = (4x+10)^\circ$ and $m\angle C = (2x+20)^\circ$. Find x and both angles.

Problem 19: Ferris wheel seats

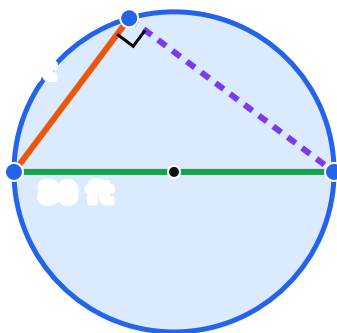
Aisha rides a Ferris wheel with 12 seats spaced equally around the rim. (a) Find the central angle between two neighboring seats. (b) Seats P and Q are 3 seats apart along the shorter way around. Find the central angle $\angle POQ$. (c) Aisha sits in a seat on the longer arc between P and Q . Find the angle between her lines of sight to P and Q .

Problem 20: Pizza cut

Jamal cuts a circular pizza with a 20-inch diameter along a straight chord that is 12 inches long. How far is the cut from the center of the pizza?

Problem 21: Plaza lights

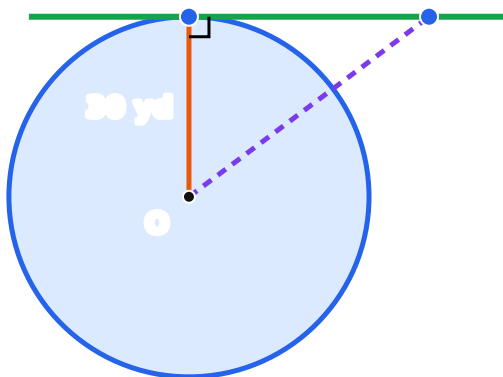
Light poles A and B stand at opposite ends of a diameter of a circular plaza that is 80 feet across. Liam stands at point L on the edge, 48 feet from pole A . Find $m\angle ALB$ and the distance from Liam to pole B .



Light poles A and B stand at the ends of a diameter.

Problem 22: Pond path

A straight path touches a circular pond at point T . The pond has radius 30 yards and its center is O . Mei stands at P on the path, 40 yards from T . Find OP and the shortest distance from Mei to the water.



A straight path touches the pond at T.

Problem 23: Central and inscribed algebra

Central angle $\angle AOB$ and inscribed angle $\angle ACB$ intercept the same arc.
 $m\angle AOB = (12x - 20)^\circ$ and $m\angle ACB = (5x - 5)^\circ$. Find x and both angles.

Problem 24: Tangents and arcs algebra

Tangent segments from P touch a circle at A and B . $m\angle P = (4x - 2)^\circ$ and minor arc AB measures $(6x + 2)^\circ$. Find x , the angle, and the arc.