

Geometry · Circles: Chords, Arcs and Inscribed Angles · Test Answer Key

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

Use this answer key to score the circles test out of 20 points. Every solution is fully worked, and the scoring note after each one explains how the points are earned, including partial credit for correct reasoning with a small arithmetic slip.

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

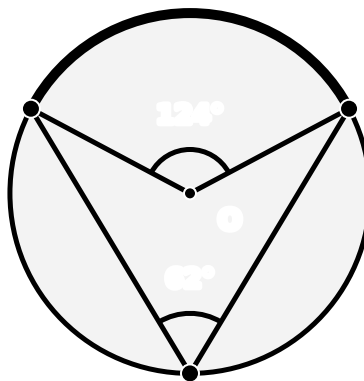
Question 1: Similar circles (2 points)

- a. $\frac{15}{6} = \frac{5}{2}$. **Scale factor** $\frac{5}{2}$
- b. Circumferences scale by the same factor: $12\pi \cdot \frac{5}{2} = 30\pi$. 30π

Scoring: 1 point for each part.

Question 2: Central and inscribed angles (2 points)

- a. A central angle equals its arc. 124°
- b. An inscribed angle is half its arc: $\frac{124}{2} = 62$. 62°



The central angle measures 124° , the same as arc AB; the inscribed angle measures half, 62° .

Scoring: 1 point for each angle.

Question 3: Inscribed angle algebra (2 points)

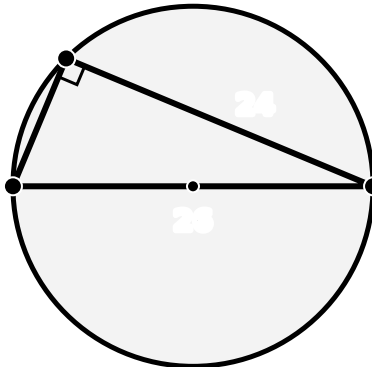
$5x+2 = \frac{1}{2}(12x-12)$ gives $5x+2 = 6x-6$, so $x = 8$. The angle is $5(8)+2 = 42^\circ$ (the arc is 84°).

$x = 8$ and the angle measures 42° .

Scoring: 1 point for a correct equation and x ; 1 point for the angle measure.

Question 4: Triangle in a semicircle (2 points)

- a. An angle inscribed in a semicircle is a right angle. 90°
- b. $BC = \sqrt{26^2 - 10^2} = \sqrt{576} = 24$. $BC = 24$



Right angle at C, so 10, 24, 26 form a right triangle.

Scoring: 1 point for naming the right angle with a reason; 1 point for the correct length.

Question 5: Tangent and radius (3 points)

- a. A radius is perpendicular to a tangent at the point of tangency. 90°
- b. $PT = \sqrt{15^2 - 9^2} = \sqrt{144} = 12$. $PT = 12$
- c. $180^\circ - 90^\circ - 53^\circ = 37^\circ$. 37°

Scoring: 1 point for each part.

Question 6: Tangents from a point (2 points)

- a. The angle at P and the minor arc sum to 180° : $180^\circ - 64^\circ = 116^\circ$. 116°
- b. $360^\circ - 116^\circ = 244^\circ$. 244°

Scoring: 1 point for each arc.

Question 7: Chord and center (2 points)

The perpendicular from the center bisects the chord, so half the chord is 20.

$$d = \sqrt{25^2 - 20^2} = \sqrt{225} = 15.$$

The distance is 15 units.

Scoring: 1 point for using the bisected chord (half length 20); 1 point for the correct distance.

Question 8: Inscribed quadrilateral (3 points)

$\angle A$ and $\angle C$ are opposite: $(3x+15)+(5x-3)=180$, $8x+12=180$, $x=21$. $\angle B$ and $\angle D$ are opposite: $(4y+2)+(2y+22)=180$, $6y+24=180$, $y=26$.

$\angle A=78^\circ$, $\angle B=106^\circ$, $\angle C=102^\circ$, $\angle D=74^\circ$. Check: $78+106+102+74=360$.

$x=21$, $y=26$; **angles** 78° , 106° , 102° , 74° .

Scoring: 1 point for x ; 1 point for y ; 1 point for all four angle measures.

Question 9: Skating rink (2 points)

a. Noah's angle is inscribed in a semicircle. 90°

b. $NB = \sqrt{60^2 - 36^2} = \sqrt{2304} = 48$. **48 feet**

Scoring: 1 point for the angle with its reason; 1 point for the correct distance.

Total
20 points