

Geometry · Arc Length, Sector Area and Radians · Quiz

Common Core G-C.B.5 · mathovore.fr

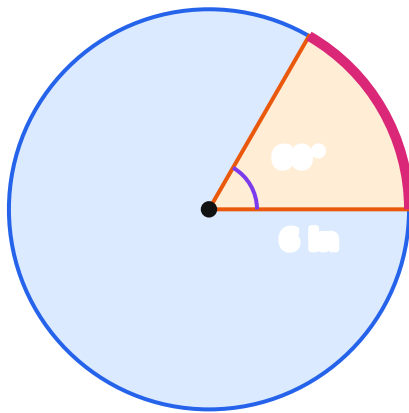
Name: _____ Date: ____/____/____ Score: _____

Ten quick multiple-choice questions check arc length, sector area, radian measure and degree-radian conversion. Pick the one best answer for each. The explanation after each question shows the fraction-of-a-circle idea and points out the most common slip.

GeometryCommon Core: G-C.B.5

Questions

Question 1



Sector with radius 6 in and central angle 60 degrees.

What is the arc length of the sector shown?

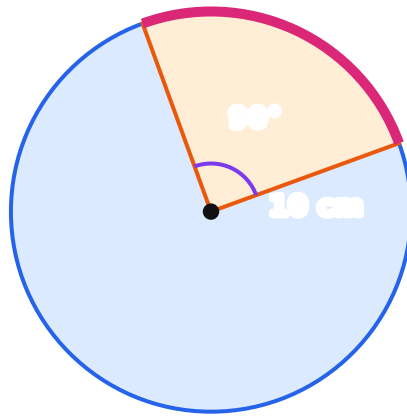
- A. π in
- B. 2π in
- C. 6π in
- D. 12π in

Question 2

A sector has radius 6 in and central angle 60° . What is its area?

- A. $6\pi \text{ in}^2$
- B. $36\pi \text{ in}^2$
- C. $2\pi \text{ in}^2$
- D. $12\pi \text{ in}^2$

Question 3



Sector with radius 10 cm and central angle 90 degrees.

What is the area of the sector shown?

- A. $100\pi \text{ cm}^2$
- B. $25\pi \text{ cm}^2$
- C. $5\pi \text{ cm}^2$
- D. $50\pi \text{ cm}^2$

Question 4

What is 120° in radians?

- A. $\frac{2\pi}{3}$
- B. $\frac{3\pi}{2}$
- C. $\frac{\pi}{3}$
- D. 120π

Question 5

What is $\frac{5\pi}{4}$ radians in degrees?

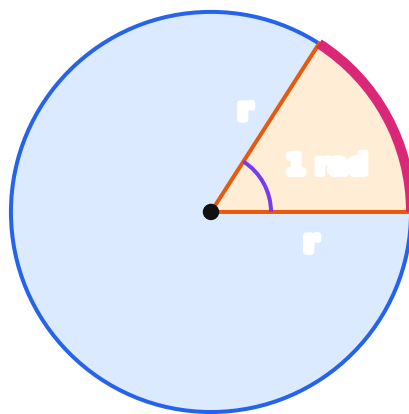
- A. 150°
- B. 300°
- C. 900°
- D. 225°

Question 6

A circle has radius 6 cm. A central angle intercepts an arc 18 cm long. What is the angle in radians?

- A. $\frac{1}{3}$ radian
- B. 24 radians
- C. 3 radians
- D. 108 radians

Question 7



An angle of one radian.

The angle shown has an arc exactly as long as the radius. About how many degrees is it?

- A. About 3.14°
- B. About 180°
- C. About 57.3°
- D. About 6.28°

Question 8

An arc of length 4π in lies on a circle with radius 8 in. What is the central angle?

- A. 45°
- B. 180°
- C. 120°

D. 90°

Question 9

A sector has radius 12 ft and central angle $\frac{\pi}{3}$ radians. What is its area?

- A. $48\pi \text{ ft}^2$
- B. $12\pi \text{ ft}^2$
- C. $24\pi \text{ ft}^2$
- D. $4\pi \text{ ft}^2$

Question 10

A sector has radius 5 in and arc length $\frac{5\pi}{2}$ in. What is its central angle in radians?

- A. $\frac{\pi}{2}$
- B. $\frac{\pi}{4}$
- C. $\frac{5\pi}{2}$
- D. 2π

Answer key

1. **B** – The arc is $\frac{1}{6}$ of the circumference 12π , which is 2π in. Using 12π in is the whole circumference.
2. **A** – Take $\frac{1}{6}$ of the circle's area 36π to get 6π . 36π is the whole circle and 2π is the arc length.
3. **B** – A 90° sector is $\frac{1}{4}$ of the circle: 100π divided by 4 is 25π . 5π is the arc length, and 50π comes from halving.
4. **A** – Multiply by π over 180: $120/180 = \frac{2}{3}$, so 2π over 3. Flipping the fraction gives 3π over 2.
5. **D** – Multiply by 180 over π : 5 times 180 divided by 4 is 225. Forgetting to divide by 4 gives 900 degrees.
6. **C** – Radian measure is arc length divided by radius: $18/6 = 3$. Dividing the other way gives $\frac{1}{3}$.
7. **C** – One radian is 180 over π degrees, about 57.3° . The numbers 3.14 and 6.28 are radian measures of a half and full turn.
8. **D** – The circumference is 16π , so the arc is 4π over $16\pi = \frac{1}{4}$ of the circle, which is 90° .
9. **C** – Use $A = \frac{1}{2}r^2\theta$ times $\theta = 72$ times $\pi/3 = 24\pi$. Forgetting the $\frac{1}{2}$ gives 48π .
10. **A** – Radian measure is s divided by r : $(5\pi \text{ over } 2)$ divided by 5 = π over 2. Leaving it as 5π over 2 skips the division by the radius.

Remember:

- Arc length: $s = \frac{\theta}{360} \cdot 2\pi r$ with θ in degrees.
- Sector area: $A = \frac{\theta}{360} \cdot \pi r^2$ with θ in degrees.
- Radian measure: $\theta = \frac{s}{r}$, so $s = r\theta$ and $A = \frac{1}{2}r^2\theta$.
- $180^\circ = \pi$ radians, and one radian is about 57.3° .