

Algebra 2 - Radians and the Unit Circle - Quiz

Common Core F-TF.A.1, F-TF.A.2, F-TF.A.3 · maths-pdf.fr/en/

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

Answer ten multiple-choice questions on radians and the unit circle. Choose one option for each question, then read the explanation to see why the correct choice works and which mistake, such as using the wrong sign in a quadrant, each wrong choice shows.

Algebra 2 · Common Core State Standards: **F-TF.A.1, F-TF.A.2, F-TF.A.3**

Questions

Question 1

What is 180° in radians?

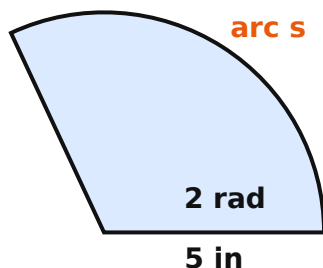
- A. π
- B. 2π
- C. $\frac{\pi}{2}$
- D. 180π

Question 2

Convert 90° to radians.

- A. $\frac{\pi}{4}$
- B. $\frac{\pi}{2}$
- C. π
- D. $\frac{3\pi}{2}$

Question 3

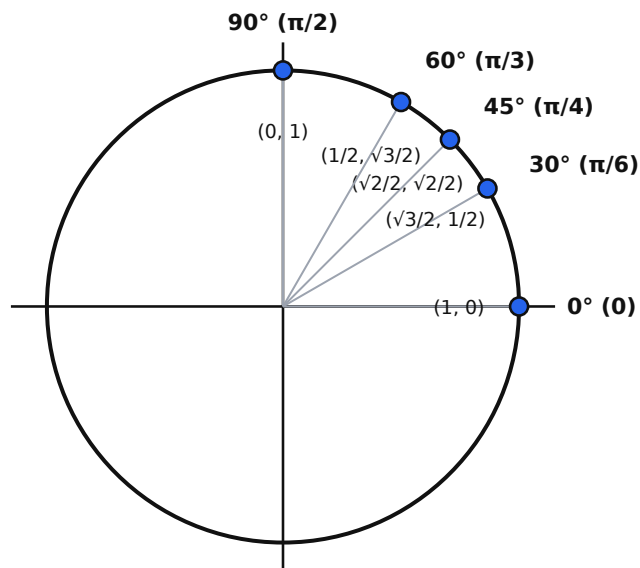


A sector: $s = r$ times the central angle in radians.

A sector has radius 5 inches and central angle 2 radians. What is the arc length?

- A. 2.5 inches
- B. 7 inches
- C. 10π inches
- D. 10 inches

Question 4



Quadrant I: the points $(\cos \theta, \sin \theta)$ for the special angles.

What is the point on the unit circle at $\pi/3$?

- A. $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$
- B. $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$
- C. $\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$
- D. $\left(1, \frac{\pi}{3}\right)$

Question 5

What is $\cos \pi$?

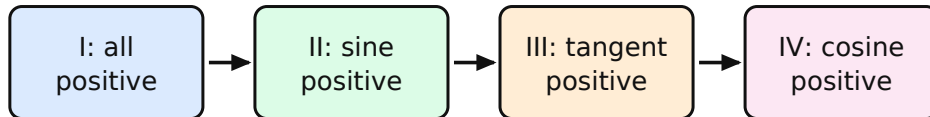
- A. -1
- B. 0
- C. 1
- D. undefined

Question 6

What is $\sin \frac{7\pi}{6}$?

- A. $\frac{1}{2}$
- B. $-\frac{\sqrt{3}}{2}$
- C. $\frac{\sqrt{3}}{2}$
- D. $-\frac{1}{2}$

Question 7



Signs by quadrant: All, Sine, Tangent, Cosine.

In which quadrant is tangent positive but sine negative?

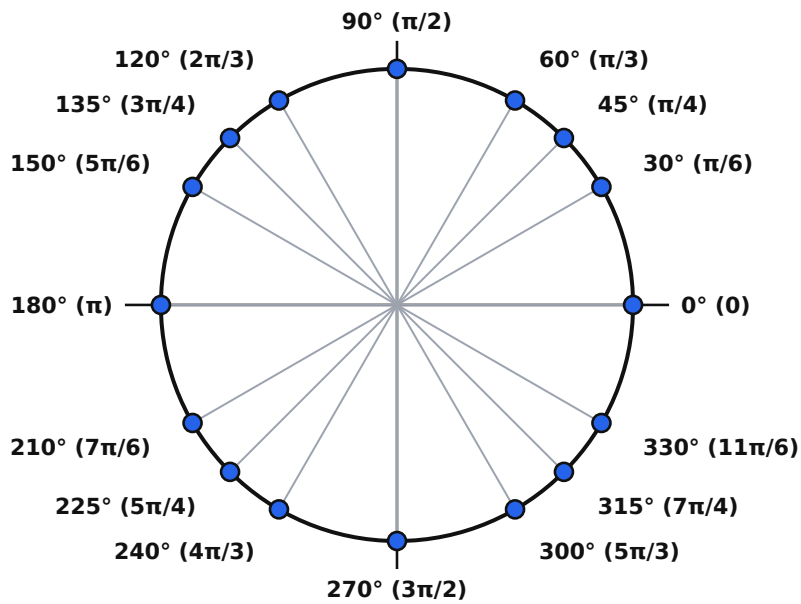
- A. Quadrant III
- B. Quadrant I
- C. Quadrant II
- D. Quadrant IV

Question 8

What is $\tan \frac{\pi}{4}$?

- A. 0
- B. 1
- C. $\sqrt{2}/2$
- D. undefined

Question 9



Angles around the unit circle in degrees and radians.

Which angle in $[0, 2\pi)$ has the same sine as $5\pi/6$?

- A. $\frac{7\pi}{6}$
- B. $\frac{11\pi}{6}$
- C. $\frac{\pi}{6}$
- D. $\frac{2\pi}{3}$

Question 10

Which angle is coterminal with $\frac{\pi}{3}$?

- A. $\frac{4\pi}{3}$
- B. $\frac{2\pi}{3}$
- C. $\frac{7\pi}{3}$
- D. $-\frac{\pi}{6}$

Answers

1. **A** - A half turn is π radians; a full turn is 2π .
2. **B** - $90 \cdot \pi/180 = \pi/2$.
3. **D** - $s = r\theta = 5 \cdot 2 = 10$. The angle is already in radians, so no π is needed.
4. **B** - At 60 degrees the x-coordinate (cosine) is $1/2$ and the y-coordinate (sine) is $\sqrt{3}/2$.
5. **A** - The point at π is $(-1, 0)$, so cosine is the x-coordinate -1 .
6. **D** - The angle is in quadrant III with reference angle $\pi/6$, so sine is negative: $-1/2$.
7. **A** - In quadrant III, both sine and cosine are negative, so tangent (their ratio) is positive.
8. **B** - $\sin$ and $\cos$ are both $\sqrt{2}/2$, so their ratio is 1 .
9. **C** - $5\pi/6$ and $\pi/6$ are mirror images across the y-axis, so they have the same y-coordinate (sine).
10. **C** - Adding a full turn (2π) gives $\pi/3 + 2\pi = 7\pi/3$.

Remember

- $\theta = s / r$, and $180^\circ = \pi$ radians.
- Arc length $s = r\theta$ when θ is in radians.
- Point on the unit circle at θ : $(\cos \theta, \sin \theta)$.
- $\tan \theta = \sin \theta / \cos \theta$; $\cos^2 \theta + \sin^2 \theta = 1$.
- Use reference angles and quadrant signs for exact values.