

Precalculus - Radians and the Unit Circle - Quiz

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

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

Pick the best answer for 10 questions on radians and the unit circle. Explanations name the common errors, such as using the wrong quadrant sign.

Precalculus · Common Core State Standards: **F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.A.4**

Questions

Question 1

Convert 90° to radians.

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

Question 2

Convert $\frac{2\pi}{3}$ to degrees.

- A. 120°
- B. 60°
- C. 240°
- D. 150°

Question 3

A circle has radius 4. What is the arc length for $\theta = \frac{\pi}{2}$?

- A. 2π
- B. 8π
- C. 4π
- D. π

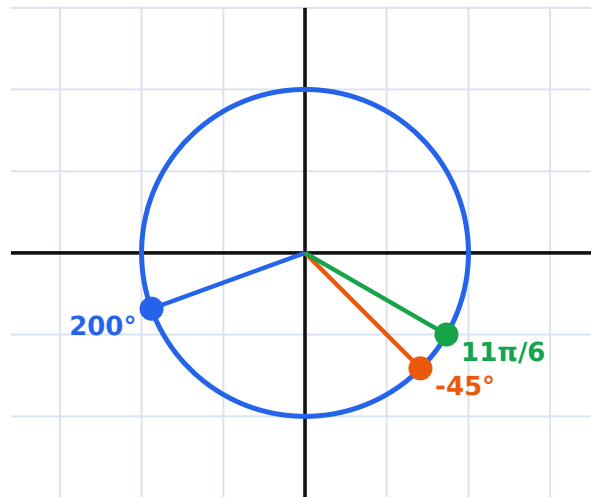
Question 4

What is $\cos\frac{\pi}{3}$?

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

Question 5

Which quadrant contains the terminal side of 200° ?

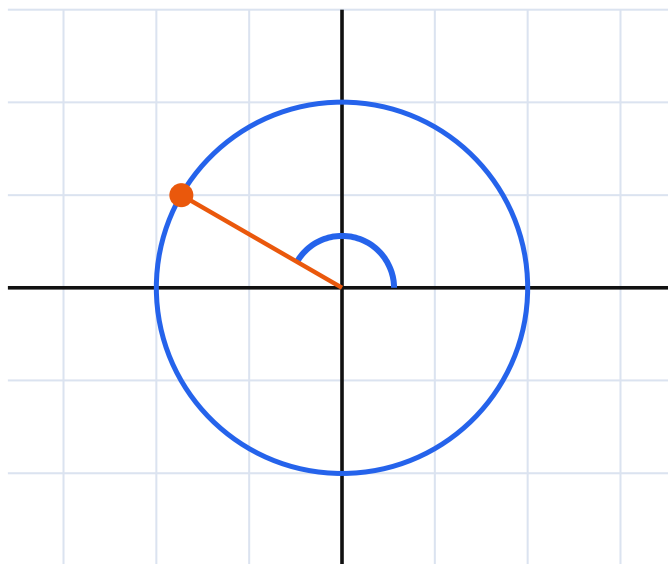


Angles on the unit circle.

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

Question 6

What is $\sin \frac{5\pi}{6}$?



Angle $5\pi/6$.

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

Question 7

Which angle is coterminal with $\frac{\pi}{4}$?

- A. $\frac{5\pi}{4}$
- B. $\frac{3\pi}{4}$
- C. $-\frac{3\pi}{4}$
- D. $\frac{9\pi}{4}$

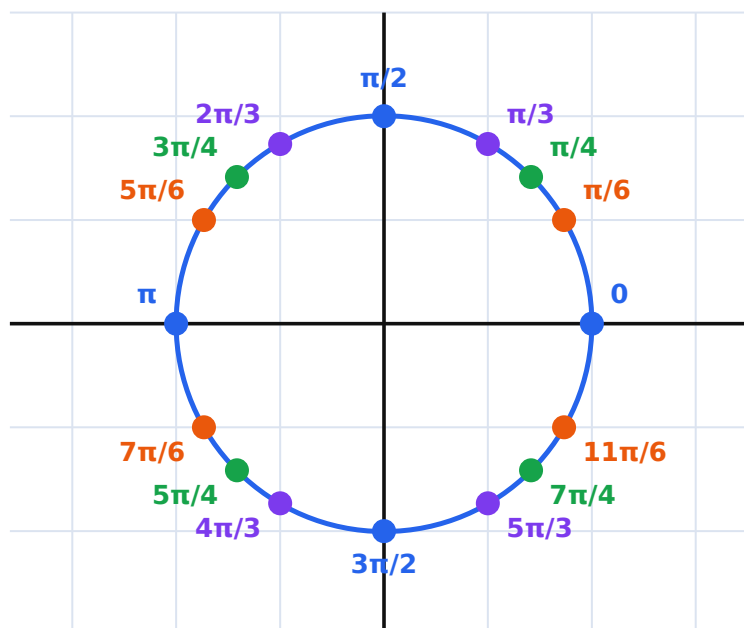
Question 8

What is $\tan \frac{3\pi}{4}$?

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

Question 9

The unit circle shows the special angles. Which point is at $\frac{\pi}{2}$?



Special angles on the unit circle.

- A. (1,0)
- B. (0,1)

- C. $(0,-1)$
- D. $(-1,0)$

Question 10

What is the area of a sector with radius 6 and $\theta = \frac{\pi}{3}$?

- A. 6π
- B. 12π
- C. 2π
- D. 18π

Answers

1. **B** - $90 \text{ times } \pi/180 = \pi/2$. Mixing up 90 and 180 gives π .
2. **A** - Multiply by $180/\pi$: $(2/3)(180) = 120$.
3. **A** - $s = r \theta = 4 \text{ times } \pi/2 = 2 \pi$.
4. **C** - The point on the unit circle at $\pi/3$ is $(1/2, \sqrt{3}/2)$, so cosine is $1/2$.
5. **D** - 200 is between 180 and 270, which is quadrant III.
6. **B** - Reference angle $\pi/6$ in quadrant II, where sine is positive: $1/2$.
7. **D** - Add 2π : $\pi/4 + 8 \pi/4 = 9 \pi/4$.
8. **C** - Reference angle $\pi/4$ gives $|\tan| = 1$, and tangent is negative in quadrant II.
9. **B** - At $\pi/2$ the terminal side points straight up: $(\cos, \sin) = (0, 1)$.
10. **A** - $A = 1/2 r^2 \theta = 1/2 \text{ times } 36 \text{ times } \pi/3 = 6 \pi$. Forgetting the $1/2$ gives 12π .

Remember

- π radians = 180 degrees; convert with the factor $\pi/180$ or $180/\pi$.
- Arc length $s = r \theta$ and sector area $A = (1/2) r^2 \theta$, with θ in radians.
- The point on the unit circle at angle θ is $(\cos \theta, \sin \theta)$.
- Reference angle: the acute angle to the x-axis; the quadrant sets the sign.
- Coterminal angles differ by 2π and have the same trig values.