

Precalculus · Angles, Radians and the Unit Circle · Test

Common Core F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.A.4 · mathovore.fr

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

This precalculus unit circle test checks angles, radians and the unit circle in 45 minutes, with 9 questions for a total of 20 points.

This test has 9 questions worth 20 points in total and takes about 45 minutes. A calculator is allowed, but exact answers in terms of pi and square roots are expected unless a decimal is requested. Show your reasoning.

Test information

- **Grade:** Precalculus
- **Chapter:** Angles, Radians and the Unit Circle
- **Common Core:** F-TF.A.1, F-TF.A.2, F-TF.A.3, F-TF.A.4
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 2 pts; Question 3: 3 pts; Question 4: 2 pts; Question 5: 3 pts; Question 6: 2 pts; Question 7: 2 pts; Question 8: 2 pts; Question 9: 2 pts)

Precalculus Unit Circle Test: questions 1-5

Question 1: Converting angle measures (2 points)

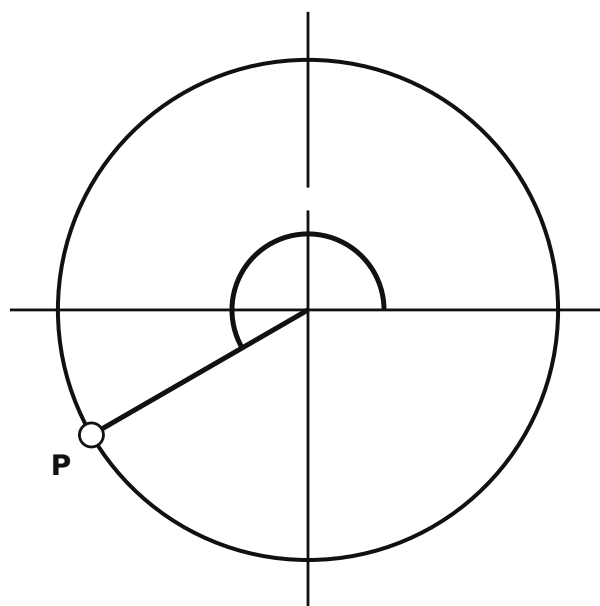
- Convert 225° to radians. (1 point)
- Convert $\frac{7\pi}{6}$ to degrees. (1 point)

Question 2: Coterminal and reference angles (2 points)

- Find the angle in $[0, 2\pi)$ that is coterminal with $\frac{23\pi}{6}$. (1 point)
- Find the reference angle of $\frac{23\pi}{6}$. (1 point)

Question 3: Point on the unit circle (3 points)

The figure shows the angle $\theta = \frac{7\pi}{6}$ on the unit circle.

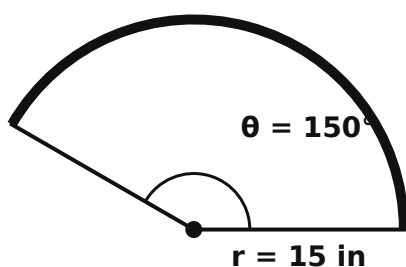


Angle $7\pi/6$ and its point P.

- Write the exact coordinates of P . (1 point)
- Find $\tan \frac{7\pi}{6}$. (1 point)
- Find $\sin\left(-\frac{7\pi}{6}\right)$. (1 point)

Question 4: Arc length of a sector (2 points)

A pizza slice is a sector with radius 15 in.



A pizza slice sector.

- Write the central angle in radians. (1 point)
- Find the length of the curved crust, to two decimal places. (1 point)

Question 5: Angular and linear speed (3 points)

A Ferris wheel of radius 50 ft makes one full revolution every 8 minutes.

- Find its angular speed in radians per minute. (1 point)
- Find the linear speed of a rider in feet per minute, to two decimal places. (1 point)
- Find how far a rider travels in 20 minutes, to two decimal places. (1 point)

Precalculus Unit Circle Test: questions 6-9

Question 6: Solving trigonometric equations (2 points)

Solve each equation for θ in $[0, 2\pi)$.

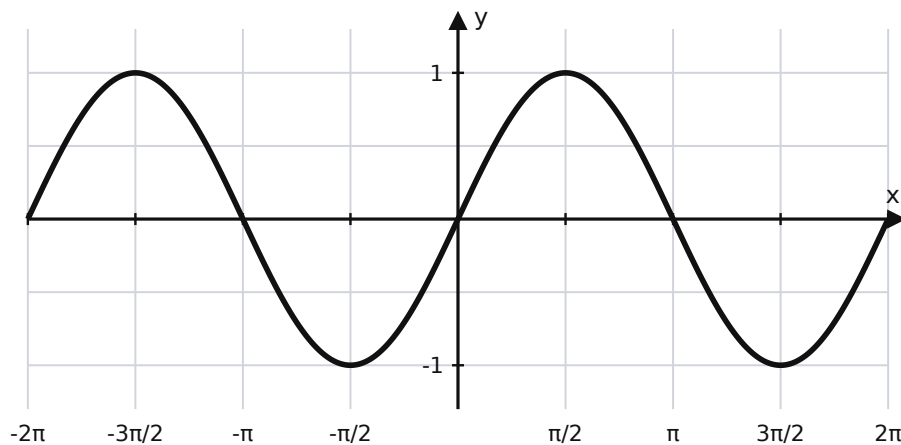
- $\cos \theta = -\frac{\sqrt{3}}{2}$ (1 point)
- $\tan \theta = 1$ (1 point)

Question 7: Even and odd (2 points)

- Find the exact value of $\tan\left(-\frac{5\pi}{4}\right)$. (1 point)
- Decide whether $f(x) = x^2 \sin x$ is even, odd or neither, and justify. (1 point)

Question 8: Periodicity of sine (2 points)

The graph shows $y = \sin x$ and $\sin \frac{\pi}{6} = \frac{1}{2}$.



Graph of the sine function.

- State the period of $y = \sin x$. (1 point)
- Find $\sin \frac{13\pi}{6}$ and $\sin\left(-\frac{7\pi}{6}\right)$. (1 point)

Question 9: Unit circle coordinates (2 points)

The angle θ lies in Quadrant II and $\cos\theta = -\frac{8}{17}$.

- a. Find $\sin\theta$. (1 point)
- b. Find $\tan\theta$. (1 point)

How to use this precalculus unit circle test

Take this precalculus unit circle test without notes, then grade it with the test answer key out of 20 points.

