

Algebra 2 - Radians and the Unit Circle - Test

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

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

This 45-minute test on radians and the unit circle has 9 questions worth 20 points in total. The questions move from direct skills to multi-step problems. Show your work, because partial credit is given for a correct setup and sound reasoning.

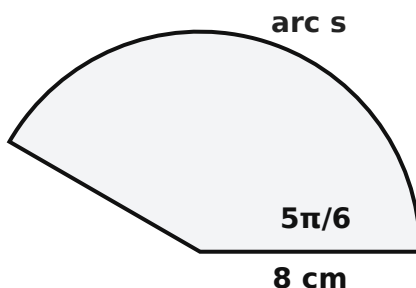
About this test

- Grade: Algebra 2
- Chapter: Radians and the Unit Circle
- Standards: F-TF.A.1, F-TF.A.2, F-TF.A.3
- Time: 45 minutes
- Total: 20 points

Question 1 - Convert angles [2 pts]

- Convert 150° to radians. (1 point)
- Convert $\frac{5\pi}{3}$ to degrees. (1 point)

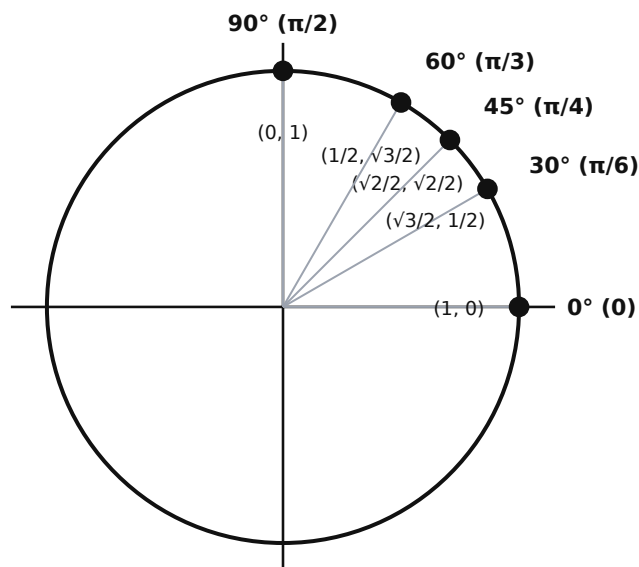
Question 2 - Arc length [2 pts]



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

A sector has radius 8 centimeters and central angle $\frac{5\pi}{6}$. Find the arc length in terms of π .

Question 3 - Exact values [3 pts]



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

Use the unit circle to find each exact value.

- a. $\sin \frac{\pi}{3}$ (1 point)
- b. $\cos \frac{\pi}{4}$ (1 point)
- c. $\tan \frac{\pi}{6}$ (1 point)

Question 4 - Reference angles [3 pts]

Find each exact value.

- a. $\cos \frac{4\pi}{3}$ (1 point)
- b. $\sin \frac{11\pi}{6}$ (1 point)
- c. $\tan \frac{5\pi}{4}$ (1 point)

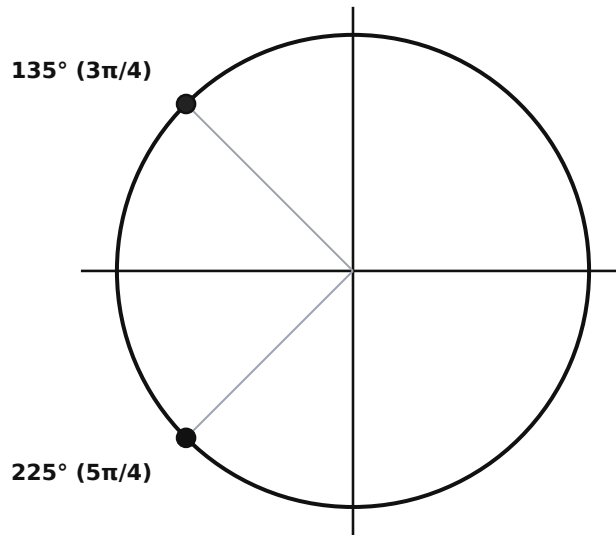
Question 5 - Solve for the angle [2 pts]

Find all θ in $[0, 2\pi)$ with $\cos \theta = \frac{\sqrt{2}}{2}$.

Question 6 - Coterminal and negative angles [2 pts]

Evaluate $\sin \frac{9\pi}{4}$ and $\cos \left(-\frac{2\pi}{3} \right)$.

Question 7 - Point on the unit circle [2 pts]



Two marked angles.

The point P on the unit circle at angle $\frac{3\pi}{4}$ is marked. Give its coordinates.

Question 8 - Bike wheel [2 pts]

A bicycle wheel has radius 14 inches. How far does a point on the tire travel when the wheel turns through $\frac{5\pi}{2}$ radians? Give the exact value and round to the nearest inch.

Question 9 - Find the error [2 pts]

Liam says $\tan\frac{\pi}{2}=0$ because $\cos\frac{\pi}{2}=0$. Explain the error.