AP Precalculus - Session 1

Homework Assignment

Assigned: Wednesday, January 7, 2026 | DUE: Friday, January 9, 2026
Name: _____ Period: _____

Instructions: Complete all problems. Show your work for full credit.
Total Problems: 30 + 3 ACT Practice

PART A: RIGHT TRIANGLE REVIEW (12 problems)

Problems 1-8: Find sin(θ), cos(θ), and tan(θ) for the given right triangle.

#	Opposite	Adjacent	Hypotenuse	sin(θ)	cos(θ)	tan(θ)
1	1	1	√2			
2	1	√3	2			
3	√3	1	2			
4	5	12	13			
5	8	15	17			
6	7	24	25			
7	20	21	29			
8	9	12	15			

Problems 9-12: Given information, find the missing trig function.

9. If sin(θ) = 8/17 and cos(θ) = 15/17, find tan(θ). _____
10. If sin(θ) = 12/13 and cos(θ) = 5/13, find tan(θ). _____
11. If tan(θ) = 3/4, and you know the opposite side is 3, what are sin(θ) and cos(θ)?
sin(θ) = _____ cos(θ) = _____
12. If tan(θ) = 5/12, and you know the opposite side is 5, what are sin(θ) and cos(θ)?
sin(θ) = _____ cos(θ) = _____

PART B: DEGREE-RADIAN CONVERSIONS (12 problems)

Problems 13-18: Convert degrees to radians (express in terms of π).

#	Degrees	Show Work	Radians
13	15°		
14	75°		
15	105°		
16	180°		
17	225°		
18	330°		

Problems 19-24: Convert radians to degrees.

#	Radians	Show Work	Degrees
19	π/12		
20	5π/12		
21	2π/3		
22	4π/3		
23	3π/2		
24	11π/6		

PART C: ARC LENGTH APPLICATIONS (6 problems)

Formula: $s = r\theta$ (where θ is in radians)

25. A circle has radius 12 cm and central angle $\pi/6$ radians. Find the arc length.

Work:

Answer: _____

26. A circle has radius 9 inches and central angle $2\pi/3$ radians. Find the arc length.

Work:

Answer: _____

27. A pizza with radius 8 inches is cut into 8 equal slices. What is the arc length of the crust on one slice? (Hint: Find the central angle first!)

Work:

Answer: _____

28. A bicycle wheel has radius 14 inches. If the wheel rotates through $\pi/4$ radians, how far does the bike travel?

Work:

Answer: _____

29. A pendulum swings through an angle of $\pi/5$ radians. If the pendulum is 2 meters long, how far does the bob travel?

Work:

Answer: _____

30. A circular track has radius 50 meters. An athlete runs 1/4 of the way around. How far did they run?

Work:

Answer: _____

ACT PRACTICE PROBLEMS

These problems are similar to what you'll see on the ACT Math section.

ACT Problem 1:

In a right triangle, if one acute angle measures 35°, what is the measure of the other acute angle?
A) 35° B) 45° C) 55° D) 65° E) 145°

Answer: _____

ACT Problem 2:

Which of the following is equivalent to 270°?
F) $\pi/2$ radians G) π radians H) $3\pi/2$ radians J) 2π radians K) $5\pi/2$ radians

Answer: _____

ACT Problem 3:

A right triangle has legs of length 6 and 8. What is the length of the hypotenuse?
A) 7 B) 10 C) 12 D) 14 E) 100

Answer: _____

■ *Study Tips for Success:*

- Memorize the conversion formulas: $180° = \pi$ radians
- Practice SOH-CAH-TOA until it's automatic
- Remember: Arc length formula $s = r\theta$ ONLY works when θ is in radians!
- For Friday's class, we'll build the unit circle - review special triangles (30-60-90 and 45-45-90)