

Chapter 5 Prerequisite Skills

1. Complete the chart by converting each angle measure to its equivalent in the other systems of measurement.

Degrees	Radians	Revolutions
		$\frac{3}{4}$
135		
	$\frac{7\pi}{6}$	
288		
	1.84	
		0.475

2. State the reference angle for each angle in standard position.
- a) 135° b) 280°
 c) 85° d) 340°
3. Draw and label a right triangle to illustrate each trigonometric ratio.
- a) $\tan \theta = \frac{2}{3}$ b) $\sin \phi = \frac{1}{\sqrt{2}}$
 c) $\cos \alpha = \frac{\sqrt{3}}{2}$ d) $\tan \lambda = 1$
4. Express each ratio, using exact values.
- a) $\sin 30^\circ$ b) $\tan 45^\circ$
 c) $\cos 30^\circ$ d) $\tan 60^\circ$
5. Without using a calculator, state whether each ratio is positive or negative.
- a) $\sin 155^\circ$ b) $\cos 135^\circ$
 c) $\tan 275^\circ$ d) $\sin 355^\circ$
6. Solve each equation for $0^\circ \leq \theta \leq 360^\circ$.
- a) $\sin \theta = \frac{1}{2}$ b) $\cos \theta = -\frac{1}{\sqrt{2}}$
 c) $\tan \theta = -1$ d) $\cos \theta = -\frac{\sqrt{3}}{2}$
7. Consider the point $P(\theta) = \left(\frac{\sqrt{5}}{3}, -\frac{2}{3}\right)$.
- a) In what quadrant does θ terminate?
 b) What is the value of $\tan \theta$, expressed in simplest radical form?
 c) Determine $P\left(\theta + \frac{\pi}{2}\right)$.
8. An angle is in standard position, such that $\cos \theta = \frac{12}{15}$.
- a) Sketch a diagram to show the two possible positions of the angle.
 b) If $0^\circ \leq \theta \leq 360^\circ$, what are the possible values of θ , to the nearest degree?
9. If $\sin \theta = \frac{1}{3}$, determine the value of $\cos \theta$ if θ is not in the first quadrant. Express your answer as a mixed radical.
10. $P(\theta)$ represents a point on the unit circle, where θ is in standard position.
- a) What is a value of θ if $P(\theta) = \left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$?
 b) If $P(\theta) = \left(\frac{3}{5}, \frac{4}{5}\right)$, what are the coordinates of $P\left(\theta + \frac{\pi}{2}\right)$?
 c) If $P(\theta) = \left(\frac{3}{5}, \frac{4}{5}\right)$, what are the coordinates of $P(\theta - \pi)$?
 d) What can you say for sure about θ if $P(\theta) = \left(-\frac{2}{3}, -\frac{\sqrt{5}}{3}\right)$, and θ is measured in radians?
11. The tangent ratio can be expressed as $\tan \theta = \frac{y}{x}$, where (x, y) is a point on the unit circle and θ is the central angle in standard position, measured in radians. What is the value of each of the following? Leave answer in the simplest radical form, where possible.
- a) $\tan \frac{\pi}{3}$ b) $\tan \frac{3\pi}{4}$ c) $\tan \frac{3\pi}{2}$
12. Solve each equation.
- a) $36x^2 - 9 = 0$ b) $3x^3 + 5x^2 - 36x - 60 = 0$

