# Assignment

## Write

Explain in your own words how the Pythagorean identity $\sin^2 \theta + \cos^2 \theta = 1$ follows from the Pythagorean Theorem.

## Remember

One Pythagorean identity states that $\sin^2 \theta + \cos^2 \theta = 1$. The trigonometric ratios sine, cosine, and tangent can have different signs, negative or positive, depending on which quadrant of the coordinate plane the angle and right triangle are located.

## Practice

Use the Pythagorean identity $\sin^2 \theta + \cos^2 \theta = 1$ to determine the value of each trigonometric ratio.

1. Given $\sin \theta = \frac{5}{13}$ in Quadrant I, determine $\cos \theta$.
2. Given $\cos \theta = -\frac{7}{25}$ in Quadrant III, determine $\sin \theta$.
3. Given $\sin \theta = -\frac{1}{3}$ in Quadrant IV, determine $\cos \theta$.
4. Given $\cos \theta = -\frac{2}{3}$ in Quadrant II, determine $\sin \theta$.
5. Given $\sin \theta = \frac{1}{6}$ in Quadrant II, determine $\cos \theta$ and $\tan \theta$.

## Stretch

1. Rewrite the Pythagorean identity $\sin^2 \theta + \cos^2 \theta = 1$ as an identity with $\tan \theta$ and $\sec \theta$. Show your work.
2. Rewrite the Pythagorean identity $\sin^2 \theta + \cos^2 \theta = 1$ as an identity with $\cot \theta$ and $\csc \theta$. Show your work.

© Carnegie Learning, Inc.

## Review

1. Given $\tan \theta = -\frac{\sqrt{3}}{3}$. Determine 2 values for $\theta$ such that $\theta < 0$ and 2 values for $\theta$ such that $\theta > 2\pi$.
2. Determine $\tan\left(\frac{8\pi}{3}\right)$.
3. The function $f(x) = \sin x$ has been vertically stretched by a factor of 4, shifted $\frac{\pi}{2}$ radians to the right, and shifted down 2 units to create the function $v(x)$. Write the function $v(x)$.
4. Solve each logarithmic equation.
   a. $\log(4x - 5) = \log(2x - 1)$
   b. $\log x - \log 2 = 1$

© Carnegie Learning, Inc.