Assignment

Write

Explain in your own words how the Pythagorean identity 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 what quadrant of the coordinate plane the angle and right triangle are in.

Practice

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

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 $\tan\theta$.

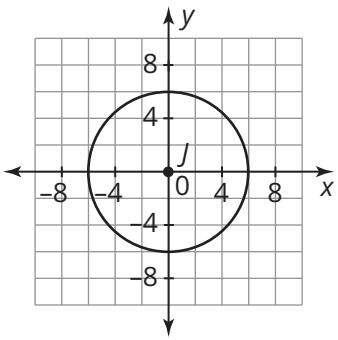
Stretch

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.

Review

1. Consider circle J centered at the origin with a radius of 6 units as shown.



   a. Verify that point $A\ (-2, 4\sqrt{2})$ lies on circle J.

   b. Use symmetry to determine three more points on circle J.

2. Determine the inverse of each function.

   a. $y = x^2 - 7$ b. $y = (x - 2)^2 + 9$

3. Determine each difference.

   a. $(-7x^3 + 9x^2 - 25x + 11) - (-15x^3 + 19x^2 + 15x + 18)$

   b. $(10x^3 - 8x^2 + 7x - 15) - (-3x^3 + 21x - 3)$