

## Section 4.4 Trigonometric Functions of Any Angle

**Objective:** In this lesson you learned how to evaluate trigonometric functions of any angle.

Course Number

Instructor

Date

### Important Vocabulary

Define each term or concept.

### Reference angles

### I. Introduction (Pages 314–315)

Let  $q$  be an angle in standard position with  $(x, y)$  a point on the terminal side of  $q$  and  $r = \sqrt{x^2 + y^2} \neq 0$ . Complete the following definitions of the trigonometric functions of any angle:

$$\sin q = \underline{\hspace{2cm}} \qquad \cos q = \underline{\hspace{2cm}}$$

$$\tan q = \underline{\hspace{2cm}} \qquad \cot q = \underline{\hspace{2cm}}$$

$$\sec q = \underline{\hspace{2cm}} \qquad \csc q = \underline{\hspace{2cm}}$$

Name the quadrants in which the sine function is positive.

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Name the quadrants in which the sine function is negative.

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Name the quadrants in which the cosine function is positive.

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Name the quadrants in which the cosine function is negative.

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Name the quadrants in which the tangent function is positive.

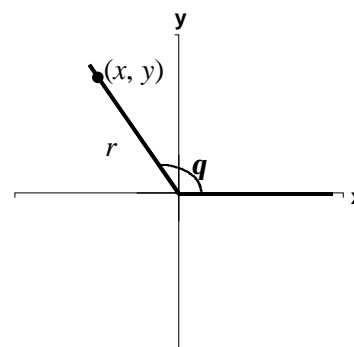
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Name the quadrants in which the tangent function is negative.

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**Example 1:** If  $\sin q = \frac{1}{2}$  and  $\tan q < 0$ , find  $\cos q$ .

**What you should learn**  
How to evaluate trigonometric functions of any angle



**II. Reference Angles** (Page 316)

**Example 2:** Find the reference angle  $q'$  for  
 (a)  $q = 210^\circ$       (b)  $q = 4.1$

***What you should learn***  
 How to use reference angles to evaluate trigonometric functions

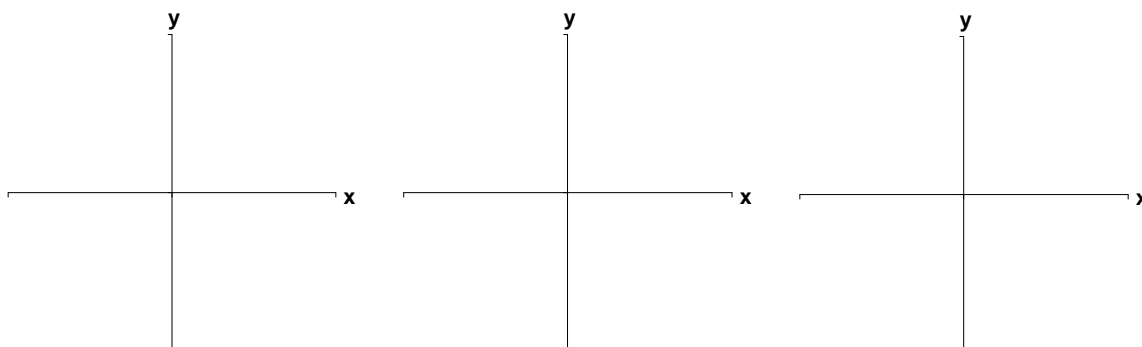
**III. Trigonometric Functions of Real Numbers**  
(Pages 317–319)

To find the value of a trigonometric function of any angle  $q$ , . . .

***What you should learn***  
 How to evaluate trigonometric functions of real numbers

**Example 3:** Evaluate  $\sin \frac{11\pi}{6}$ .

**Example 4:** Evaluate  $\cos 240^\circ$ .

**Homework Assignment**

Page(s)

Exercises