

Sine and Cosine Functions with Reference Angles and a Calculator

Learning Objectives

- Find the reference angle for a given angle
 - Use reference angles to evaluate sine and cosine functions
 - Use reference angles to find coordinates on the unit circle
 - Evaluate sine and cosine functions with a calculator
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Find the reference angle for a given angle

1. Find the reference angle for the given angle.

- a. $\frac{7\pi}{8}$

- b. 255°

Use reference angles to evaluate sine and cosine function

2. Use reference angles to evaluate each of the following expressions.

- a. $\sin\left(\frac{5\pi}{4}\right)$

- b. $\cos(300^\circ)$

Use reference angles to find coordinates on the unit circle

3. Find the coordinates of a point on the unit circle with angle $\frac{11\pi}{6}$.

Evaluate sine and cosine function with a calculator

4. Find the value of the following expressions with your calculator. Round your answers to four decimal places.
- $\sin \frac{\pi}{8}$
 - $\cos \left(\frac{17\pi}{6} \right)$
 - $\sin(23^\circ)$

d. $\cos(289^\circ)$

ANSWER KEY

1. a. $\frac{\pi}{8}$; b. 75°

2. a. $-\frac{\sqrt{2}}{2}$; b. $\frac{1}{2}$

3. $\left(\frac{\sqrt{3}}{2}, -\frac{1}{2}\right)$

4. a. 0.3827; b. -0.8660; c. 0.3907; d. 0.3256