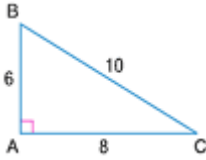


Lesson 9-8

Example 1 Find Trigonometric Ratios Find $\sin C$, $\cos C$, and $\tan C$.



$$\begin{aligned}\sin C &= \frac{\text{measure of leg opposite angle } C}{\text{measure of hypotenuse}} \\ &= \frac{6}{10} \text{ or } 0.60\end{aligned}$$

$$\begin{aligned}\cos C &= \frac{\text{measure of leg adjacent to angle } C}{\text{measure of hypotenuse}} \\ &= \frac{8}{10} \text{ or } 0.80\end{aligned}$$

$$\begin{aligned}\tan C &= \frac{\text{measure of leg opposite angle } C}{\text{measure of leg adjacent to angle } C} \\ &= \frac{6}{8} \text{ or } 0.75\end{aligned}$$

Example 2 Use a Calculator to Find Trigonometric Ratios Find each value to the nearest ten thousandth.

a. $\sin 68^\circ$

$$\boxed{\text{SIN}} 68 \boxed{\text{ENTER}} 0.9271838546$$

So, $\sin 68^\circ$ is about 0.9272.

b. $\cos 21^\circ$

$$\boxed{\text{COS}} 21 \boxed{\text{ENTER}} 0.9335804265$$

So, $\cos 21^\circ$ is about 0.9336.

c. $\tan 87^\circ$

$$\boxed{\text{TAN}} 87 \boxed{\text{ENTER}} 19.08113669$$

So, $\tan 87^\circ$ is about 19.0811.

Example 3 Use Trigonometric Ratios

Find the missing measure. Round to the nearest tenth.



The measures of an acute angle and the hypotenuse are known. You need to find the measure of the side adjacent to the angle. Use the cosine ratio.

$$\cos \angle C = \frac{\text{measure of leg adjacent to angle } C}{\text{measure of hypotenuse}} \quad \text{Write the cosine ratio.}$$

$$\cos 28^\circ = \frac{x}{52} \quad \text{Substitution}$$

$$52(\cos 28^\circ) = x \quad \text{Multiply each side by 52.}$$

$$52 \times \boxed{\text{COS}} 28 \boxed{\text{ENTER}} 45.91327483$$

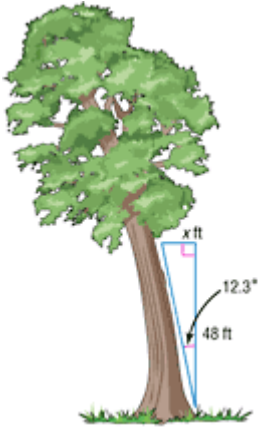
$$45.9 \approx x$$

Simplify.

The measure of the side adjacent to the acute angle is about 45.9 feet.

Example 4 Use Trigonometric Ratios to Solve a Problem

NATURE A tree has grown in such a way that its trunk tilts about 12.3° from vertical. If the tree is 48 feet tall, how far has its top shifted from its original position?



Use the tangent ratio.

$$\tan \angle A = \frac{\text{measure of leg opposite angle } A}{\text{measure of leg adjacent to angle } A}$$

Write the tangent ratio.

$$\tan 12.3^\circ = \frac{x}{48}$$

Substitution

$$48(\tan 12.3^\circ) = x$$

48 \times $\boxed{\text{TAN}}$ 12.3 $\boxed{\text{ENTER}}$ 10.4656925
 $10.5 \approx x$

Multiply each side by 48.

Simplify.

The top of the tree trunk has shifted about 10.5 feet from a vertical position.