

Lesson 11-6

Example 1

CALCULATOR Use a calculator to find what angles have the given trigonometric ratios. Round to the nearest degree.

a. $\sin A = 0.707107$

b. $\cos A = 0.3420201$

c. $\tan A = 0.404026$

Solution

Use the key sequence required by your calculator. Be sure the calculator is set in degree mode.

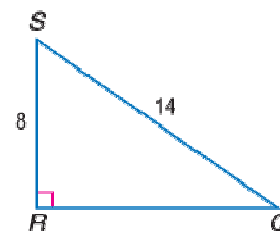
a. $\sin^{-1} 0.707107 \approx 45$
 $m\angle A \approx 45^\circ$

b. $\cos^{-1} 0.3420201 \approx 70$
 $m\angle A \approx 70^\circ$

c. $\tan^{-1} 0.404026 \approx 22$
 $m\angle A \approx 22^\circ$

Example 2

Find $m\angle Q$ in the right triangle.

**Solution**

Decide which trigonometric ratio relates the angles whose measure you want to find and the sides whose lengths are known. \overline{RS} is the side opposite $\angle Q$. \overline{QS} is the hypotenuse of the triangle. The ratio that relates an opposite side with the hypotenuse is the sine ratio.

Write and solve an equation involving the sine ratio and the given values.

$$\sin Q = \frac{RS}{QS} \quad \begin{array}{l} \text{opposite side} \\ \text{hypotenuse} \end{array}$$

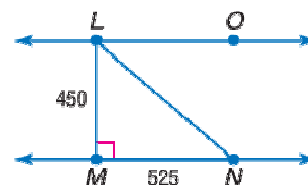
$$\sin Q = \frac{8}{14} \quad \text{Substitute known values.}$$

$$\sin Q = \frac{4}{7}$$

Use a calculator to find the inverse sine of $\frac{4}{7}$. In the triangle, $m\angle Q \approx 34.8^\circ$.

Example 3

In the figure $\overline{LO} \parallel \overline{MN}$. Find $m\angle OLN$.

**Solution**

Notice that $\angle OLN$ and $\angle LNM$ are alternate interior angles of two parallel lines cut by a transversal, so they are congruent. Use the inverse tangent function.

$$\tan \angle LNM = \frac{450}{525}$$

$$\tan \angle LNM = \frac{6}{7}$$

Using a calculator, $m\angle LNM \approx 40.6^\circ$. Since $\angle LNM \cong \angle OLN$, $m\angle OLN \approx 40.6^\circ$.