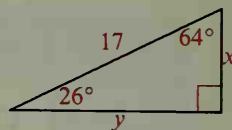


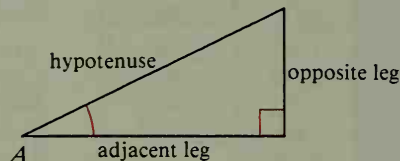
8-6 The Sine and Cosine Ratios

Suppose you want to find the legs, x and y , in the triangle at the right. You can't easily find these values using the tangent ratio because the only side you know is the hypotenuse. The ratios that relate the legs to the hypotenuse are the *sine* and *cosine*.



$$\text{sine of } \angle A = \frac{\text{leg opposite } \angle A}{\text{hypotenuse}}$$

$$\text{cosine of } \angle A = \frac{\text{leg adjacent to } \angle A}{\text{hypotenuse}}$$



We now have three useful trigonometric ratios, given below in abbreviated form:

$$\tan A = \frac{\text{opposite}}{\text{adjacent}}$$

$$\sin A = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}}$$

Example 1 Find the values of x and y to the nearest integer.

Solution $\sin 67^\circ = \frac{x}{120}$

$$x = 120 \cdot \sin 67^\circ$$

$$x \approx 120(0.9205)$$

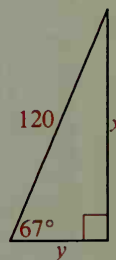
$$x \approx 110.46, \text{ or } 110$$

$$\cos 67^\circ = \frac{y}{120}$$

$$y = 120 \cdot \cos 67^\circ$$

$$y \approx 120(0.3907)$$

$$y \approx 46.884, \text{ or } 47$$



Example 2 Find the value of n to the nearest integer.

Solution $\sin n^\circ = \frac{22}{40}$

$$\sin n^\circ = 0.5500$$

$$n \approx 33$$

