

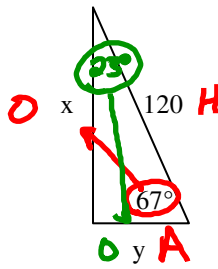
Notes for Lesson 8-6 (part I) Using the Sine Function

Yesterday we used the tangent function to find the lengths of sides and measures of angles for different right triangles. Today we will introduce another trig function to help us solve right triangles.

$$\text{Sine } \angle x = \frac{\text{side opposite } \angle x}{\text{hypotenuse}}$$

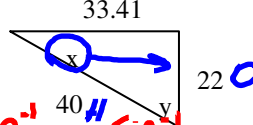
Use the appropriate function to solve for each of the variables below.

1)



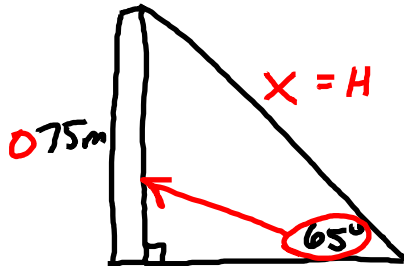
$$\begin{aligned} \sin 67 &= \frac{x}{120} \\ x &= 110.46 \\ \sin 23 &= \frac{y}{120} \\ y &= 46.89 \end{aligned}$$

2)



$$\begin{aligned} \sin 56.59 &= \frac{y}{40} \\ y &= 33.37 \\ x &= 33.37^\circ \\ y &= 90 - 33.37 = 56.63^\circ \end{aligned}$$

3) A guy wire is attached to the top of a 75 m tower and meets the ground at a 65° angle. How long is the wire?



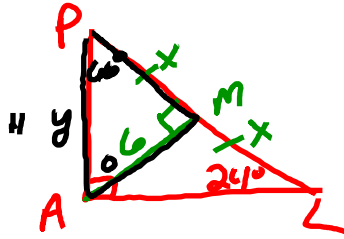
$$\begin{aligned} \sin 65 &= \frac{75}{x} \\ x &= 82.75 \text{ m} \end{aligned}$$

4) A certain jet is capable of a steady 20° climb. How much altitude does the jet gain when it moves 1 km through the air?



$$\begin{aligned} \sin 20 &= \frac{x}{1} \\ x &= 0.342 \text{ km} \end{aligned}$$

5) In $\triangle PAL$, $m\angle A = 90^\circ$, $m\angle L = 24^\circ$, and median AM is 6 cm long. Find PA .



$$\sin 66^\circ = \frac{6}{y}$$

$$y = 6.57 \text{ cm}$$