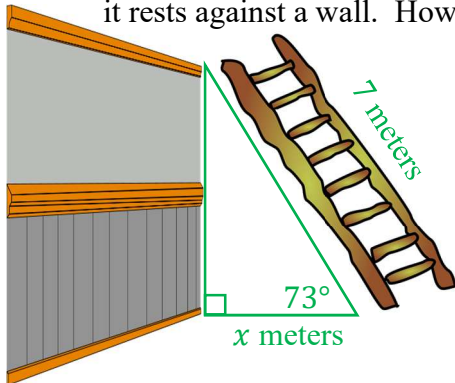


Lesson 12.2 – Problem Solving with Right Triangles

- 1) A ladder 7 meters long stands on level ground and makes a 73° angle with the ground as it rests against a wall. How far from the wall is the base of the ladder?



Since we are given the length of the hypotenuse and are asked to find the length of the adjacent side to our angle, we will use the cosine function.

$$\cos 73^\circ = \frac{x}{7}$$

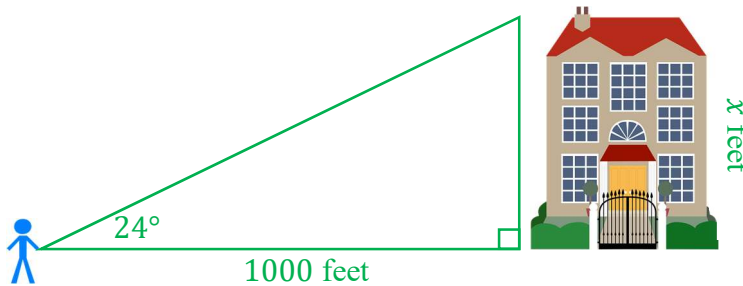
$$7 \cdot \cos 73^\circ = \frac{x}{7} \cdot 7$$

$$7 \cdot \cos 73^\circ = x$$

$$2.05 \approx x$$

The base of the ladder is about 2.05 meters from the base of the wall.

- 2) To see the top of a building 1000 feet away, you look up 24° from the horizontal. What is the height of the building?



Since we are given the length of the adjacent side to our angle and are asked to find the length of the opposite side to our angle, we will use the tangent function.

$$\tan 24^\circ = \frac{x}{1000}$$

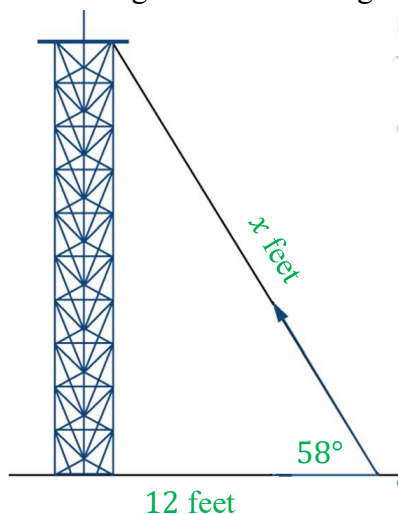
$$1000 \cdot \tan 24^\circ = \frac{x}{1000} \cdot 1000$$

$$1000 \cdot \tan 24^\circ = x$$

$$445.23 \approx x$$

The building is about 445.2 feet tall.

- 3) A guy wire is anchored 12 feet from the base of the pole. The wire makes a 58° angle with the ground. How long is the wire?



Since we are given the length of the adjacent side to our angle and are asked to find the length of the hypotenuse, we will use the cosine function.

$$\cos 58^\circ = \frac{12}{x}$$

$$x \cdot \cos 58^\circ = \frac{12}{x} \cdot x$$

$$x \cdot \cos 58^\circ = 12$$

$$\frac{x \cdot \cos 58^\circ}{\cos 58^\circ} = \frac{12}{\cos 58^\circ}$$

$$x = \frac{12}{\cos 58^\circ}$$

$$x \approx 22.65$$

The wire is about 22.65 feet long.