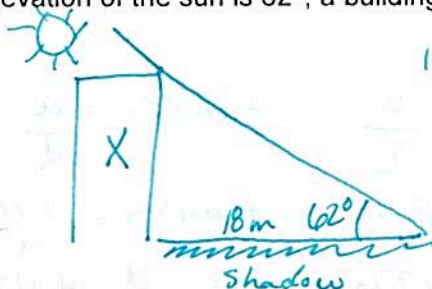


Directions: You **MUST** show all work to receive any credit

1. When the angle of elevation of the sun is 62° , a building casts a shadow 18 m long. How tall (t) is the building?

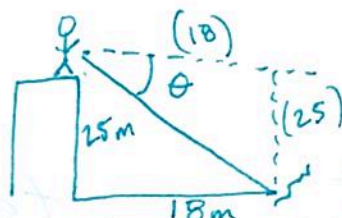


$$18 \cdot \tan 62^\circ = \frac{X}{18} \cdot 18$$

$$18 \tan 62^\circ = X$$

$$X = 33.85 \text{ m}$$

2. Fred is standing on a 25 m tower and sees a snake on the ground 18 m from the base of the tower, what is the angle of depression (d) from Fred to the snake?

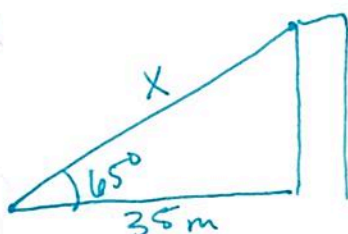


$$\tan \theta = \frac{25}{18}$$

$$\tan^{-1}\left(\frac{25}{18}\right) = \theta$$

$$\theta = 54.25^\circ$$

3. A wire is attached from the top of a tower to a point on the ground. The base of the tower is 35 m from the end of the wire on the ground. If the wire makes a 65° angle with the ground, how long is the wire (w)?

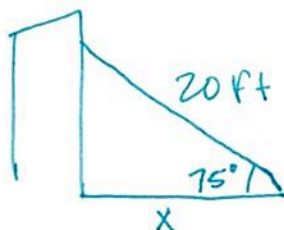


$$\cos 65^\circ = \frac{35}{X}$$

$$X = \frac{35}{\cos 65^\circ}$$

$$X = 82.82 \text{ m}$$

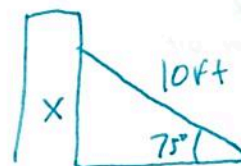
4. A ladder that is 20 ft. long is leaning against the side of a building. If the angle formed between the ladder and ground is 75° , how far is the bottom of the ladder (l) from the base of the building? If you lean a 10 foot ladder at the same angle, how far up the building will it reach (r)?



$$\cos 75^\circ = \frac{X}{20}$$

$$20 \cdot \cos 75^\circ = X$$

$$X = 5.18 \text{ ft}$$

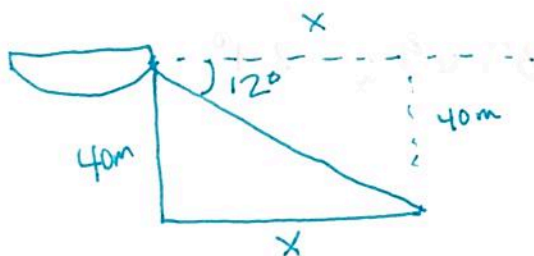


$$\sin 75^\circ = \frac{X}{10}$$

$$10 \cdot \sin 75^\circ = X$$

$$X = 9.66 \text{ ft}$$

5. A salvage ship is locating wreckage. The ship's sonar picks up a signal showing wreckage at an angle of depression measuring 12° . The ocean charts for the region list an average depth of 40 meters. If a diver is lowered from the salvage ship at this point, how far can the diver expect to travel along the ocean floor to the wreckage?



$$\tan \theta = \frac{40}{X}$$

$$X = \frac{40}{\tan 12^\circ}$$

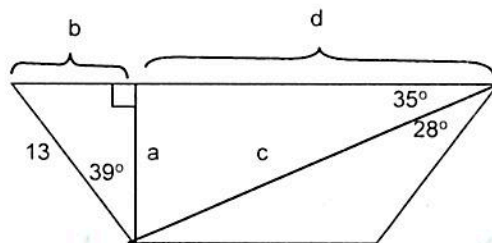
$$X = 188.19 \text{ m}$$

6. Find all the variables.

$$\sin 39 = \frac{b}{13}$$

$$13 \cdot \sin 39 = b$$

$$b = 8.18$$



$$\tan 39 = \frac{b}{a}$$

$$\tan 39 = \frac{8.18}{a}$$

$$a = 10.10$$

$$\sin 35 = \frac{a}{c}$$

$$\sin 35 = \frac{10.10}{c}$$

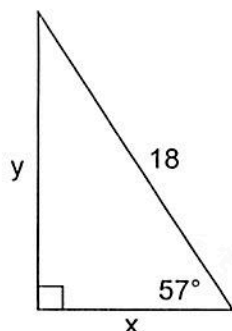
$$c = 17.61$$

$$\tan 35 = \frac{a}{d}$$

$$\tan 35 = \frac{10.10}{d}$$

$$d = 14.42$$

7.



$$\sin 57 = \frac{y}{18}$$

$$18 \sin 57 = y$$

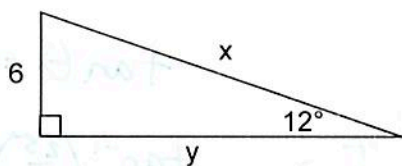
$$y = 15.10$$

$$\cos 57 = \frac{x}{18}$$

$$18 \cdot \cos 57 = x$$

$$x = 9.80$$

8.



$$\sin 12 = \frac{6}{x}$$

$$x = \frac{6}{\sin 12}$$

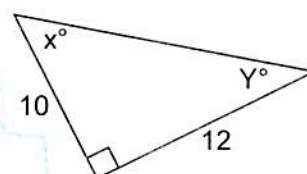
$$x = 28.86$$

$$\tan 12 = \frac{6}{y}$$

$$y = \frac{6}{\tan 12}$$

$$y = 28.23$$

9.



$$\tan^{-1}\left(\frac{12}{10}\right) = x^\circ$$

$$x^\circ = 50.19^\circ$$

$$\tan^{-1}\left(\frac{10}{12}\right) = y^\circ$$

$$y^\circ = 39.81^\circ$$

10. A wheelchair ramp has a slope of $\frac{2}{3}$. Find the angle the ramp makes with the ground to the nearest degree.

$$\tan \theta = \frac{2}{3}$$

$$\tan^{-1}\left(\frac{2}{3}\right) = \theta$$

$$\theta = 33.69 \approx 34^\circ$$

