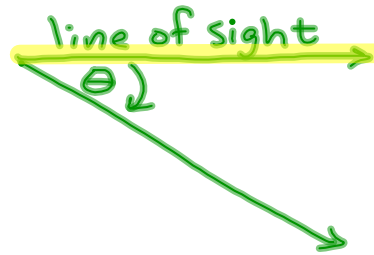
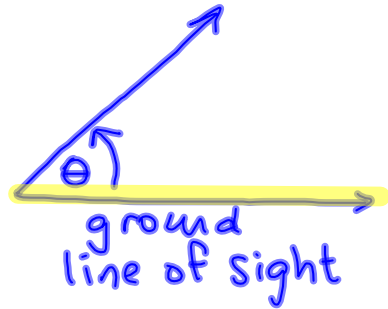


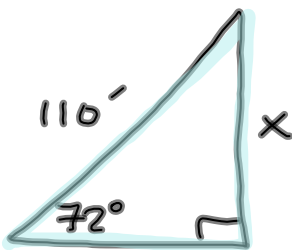
Applications using Right Triangles

*** Angles of **ELEVATION** and **DEPRESSION**

always originate from **horizontal**. ***



1. A safety regulation states that the maximum angle of elevation for a rescue ladder is 72° . If a fire department's ladder is 110 feet long, what is the maximum safe rescue height?

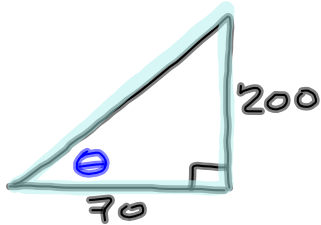
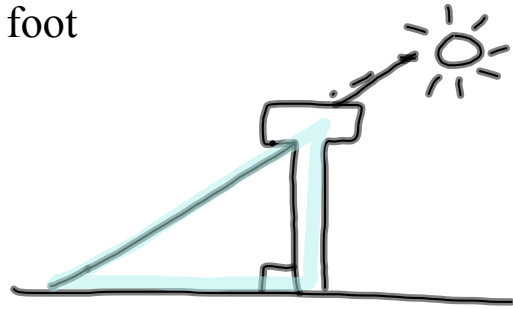


$$\sin 72^\circ = \frac{x}{110}$$

$$110 \cdot \sin 72^\circ = x$$

$$x = 104.6 \text{ feet}$$

2. The length of the shadow of a 200 foot tower is 70 feet. Find the angle of elevation to the sun.

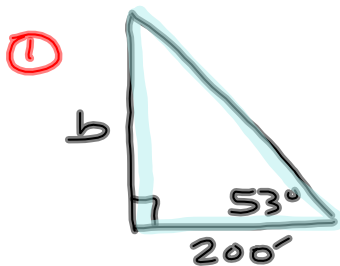
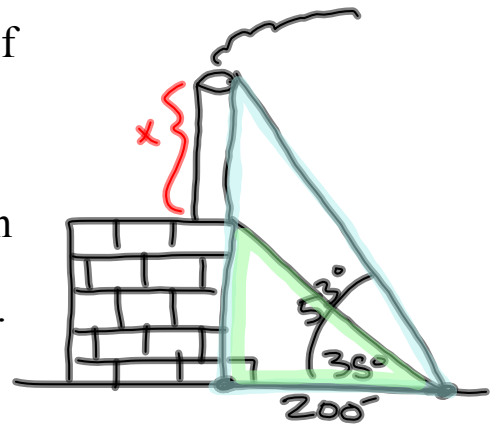


$$\tan \theta = \frac{200}{70}$$

$$\theta = \tan^{-1} \left(\frac{200}{70} \right)$$

$$\theta = 70.7^\circ$$

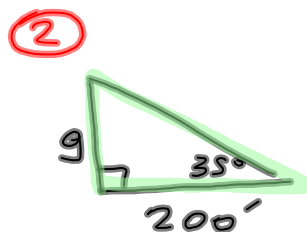
3. At the point 200 feet from the base of a building, the angle of elevation to the bottom of a smokestack on top of the building is 35° and the angle of elevation to the top of the same smokestack is 53° . Find the height of the smokestack.



$$\tan 53^\circ = \frac{b}{200}$$

$$200 \cdot \tan 53^\circ = b$$

$$b = 265'$$



$$\tan 35^\circ = \frac{g}{200}$$

$$200 \cdot \tan 35^\circ = g$$

$$g = 140'$$

③

$$x = b - g$$

$$x = 265 - 140$$

$$x = 125 \text{ ft.}$$