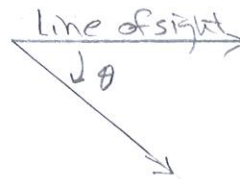
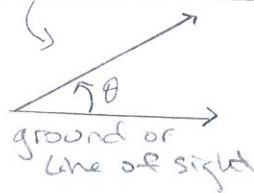


Applications using Right Triangles

Key

*** Angles of **ELEVATION** and **DEPRESSION** always originate from horizontal. ***



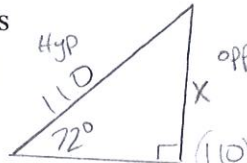
* line of sight is always horizontal

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?

① Draw a picture!



② Solve



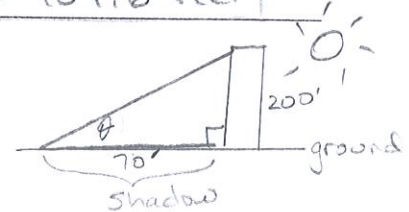
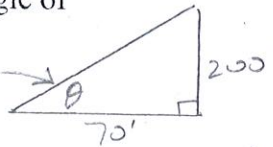
$$(110) \sin 72 = \frac{X}{110} (110)$$

$$110 \sin 72 = X$$

$$X = 104.6 \text{ Feet}$$

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

Angle of elevation

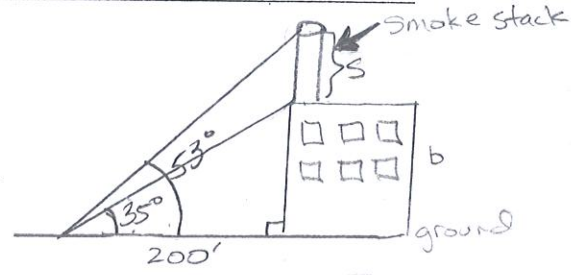


$$\tan \theta = \frac{200}{70}$$

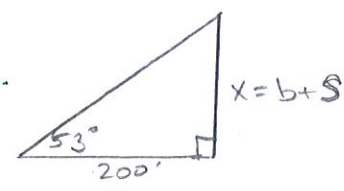
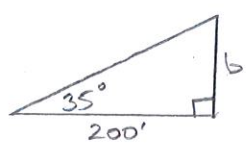
$$\theta = \tan^{-1} \frac{200}{70}$$

$$\theta = 70.7^\circ$$

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.



b = building
s = smoke stack



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

$$200 \tan 35^\circ = b$$

$$b = 140'$$

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

$$200 \tan 53^\circ = X$$

$$265.4' = X$$

$$s = 265.4' - 140'$$

$$s = 125.4 \text{ feet}$$