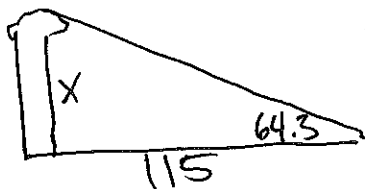


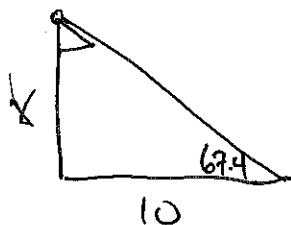
1. From a point 115 feet from the base of a redwood tree, the angle of elevation to the top of the tree is 64.3° . Find the height of the tree to the nearest foot.



$$\tan 64.3 = \frac{x}{115}$$

$$x = 238.95 \approx \boxed{239 \text{ FT}}$$

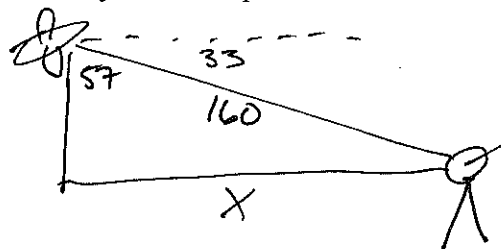
2. From a point 10 feet from the base of a flag pole, the angle of elevation to the top of the flag pole is 67.4° . Find the height of the flag pole to the nearest foot.



$$\tan 67.4 = \frac{x}{10}$$

$$\boxed{124 \text{ FT}}$$

3. DME (Distance Measuring Equipment) is standard avionic equipment on a commercial airplane. This equipment measures the distance from a plane to a radar station. If the distance from a plane to a radar station is 160 miles and the angle of depression is 33° , find the number of ground miles from a point directly below the plane to the radar station.



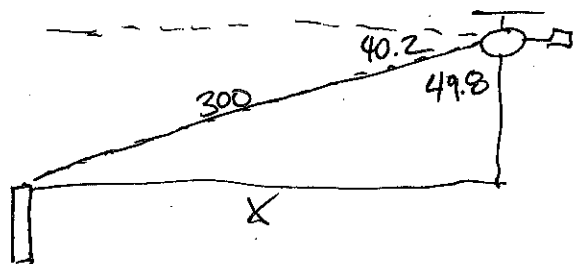
$$\sin 57 = \frac{x}{160}$$

- OR -

$$\cos 33 = \frac{x}{160}$$

$$\boxed{134.19 \text{ mi}}$$

4. If the distance from a helicopter to a tower is 300 feet and the angle of depression is 40.2° , find the distance on the ground from a point directly below the helicopter to the tower.



$$\cos 40.2 = \frac{x}{300}$$

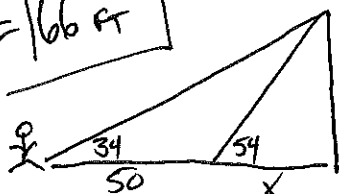
OR

$$\sin 49.8 = \frac{x}{300}$$

$$\boxed{229.14 \text{ FT}}$$

$$\tan(34) = \frac{T}{98}$$

$$T = \boxed{66 \text{ FT}}$$



5. A backpacker notes that from a certain point on level ground, the angle of elevation to a point at the top of a tree is 34° . After walking 50 closer to the tree, the backpacker notes that the angle of elevation is 54° . Find the height of the tree.

$$\tan(34) = \frac{T}{50+x} \quad (.6745)(50+x) = T$$

$$\tan(54) = \frac{T}{x} \quad (1.3764)(x) = T$$

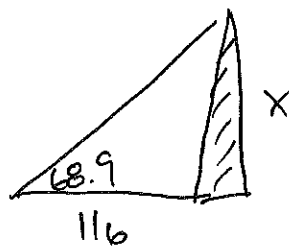
$$T = 33.725 + .6745x$$

$$T = 1.3764x$$

$$33.725 + .6745x = 1.3764x$$

$$x = 48.05$$

6. The angle of elevation from a point 116 meters from the base of the Eiffel Tower to the top of the Tower is 68.9° . Find the approximate height of the tower.

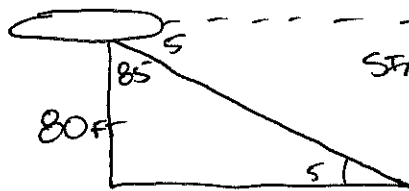


$$\tan 68.9 = \frac{x}{116}$$

$$\approx 300 \text{ m}$$

7. A submarine traveling 9 mph is descending at an angle of depression of 5° . How many minutes does it take the submarine to reach a depth of 80 feet?

$$\frac{9 \text{ mi}}{1 \text{ hr}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} = 792 \text{ ft/min}$$



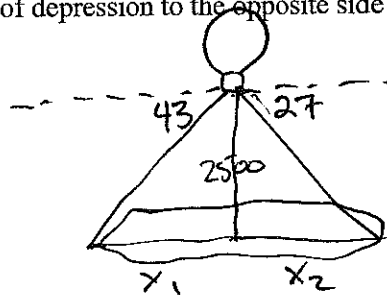
$$\sin 5 = \frac{80}{x}$$

$$x = 917.9 \text{ ft}$$

$$\frac{792 \text{ ft}}{1 \text{ min}} = \frac{917.9 \text{ ft}}{x \text{ min}}$$

$$x \approx 1.16 \text{ min}$$

8. The angle of depression of one side of a lake, measured from a balloon 2500 feet above the lake is 43° . The angle of depression to the opposite side of the lake is 27° . Find the width of the lake.



$$\tan 43 = \frac{2500}{x_1} = 268 \text{ ft}$$

$$\tan 27 = \frac{2500}{x_2} = 4907 \text{ ft}$$

$$x_1 + x_2 \approx 7588 \text{ ft}$$

9. From a point A on a line from the base of the Washington Monument, the angle of elevation to the top of the monument is 42° . From a point 100 feet away and on the same line, the angle to the top is 37.8° . Find the approximate height of the Washington Monument.

$$\tan 42 = \frac{w}{650}$$

$$w = 585.26 \text{ ft}$$

$$\tan 37.8 = \frac{w}{100+x}$$

$$\tan 42 = \frac{w}{x}$$

$$x = 650$$

$$.78 = \frac{w}{100+x} \quad w = 78 + .78x$$

$$.9 = \frac{w}{x} \quad w = .9x$$

$$.9x = 78 + .78x$$

$$.12x = 78$$

10. The angle of elevation to the top of the Egyptian pyramid Cheops is 36.4° , measured from a point 350 feet from the base of the pyramid. The angle of elevation of a face of the pyramid is 51.9° . Find the height of Cheops.

$$\tan 36.4 = \frac{H}{758.33}$$

$$\tan 36.4 = \frac{H}{350+x}$$

$$.7 = \frac{H}{350+x} \quad H = 245 + .7x$$

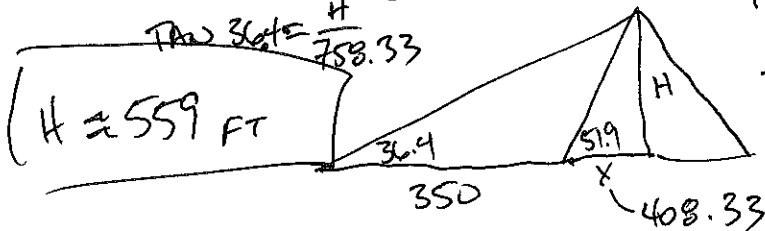
$$\tan 51.9 = \frac{H}{x}$$

$$1.3 = \frac{H}{x} \quad H = 1.3x$$

$$245 + .7x = 1.3x$$

$$245 = .6x$$

$$x = 408.33$$



$$H \approx 559 \text{ ft}$$