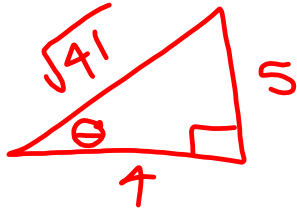section & problem numbers clearly labeled, name printed on first page, stapled in order

- 5.1 #1, 2, 7-18 all
- 5.1 #31-48 all
- 5.1 #55-74 all
- 4 problems on handout (angular speed)

Given that $\cot\theta = \frac{4}{5}$, find the other trigonometric function values of θ.

$$\sin\theta = \frac{5}{\sqrt{41}} \qquad \sec\theta = \frac{\sqrt{41}}{4}$$

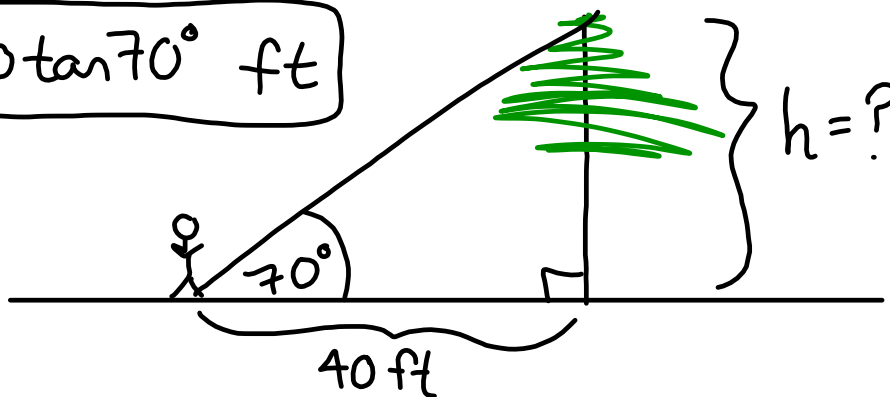$$\cos\theta = \frac{4}{\sqrt{41}} \qquad \csc\theta = \frac{\sqrt{41}}{5}$$

$$\tan\theta = \frac{5}{4}$$
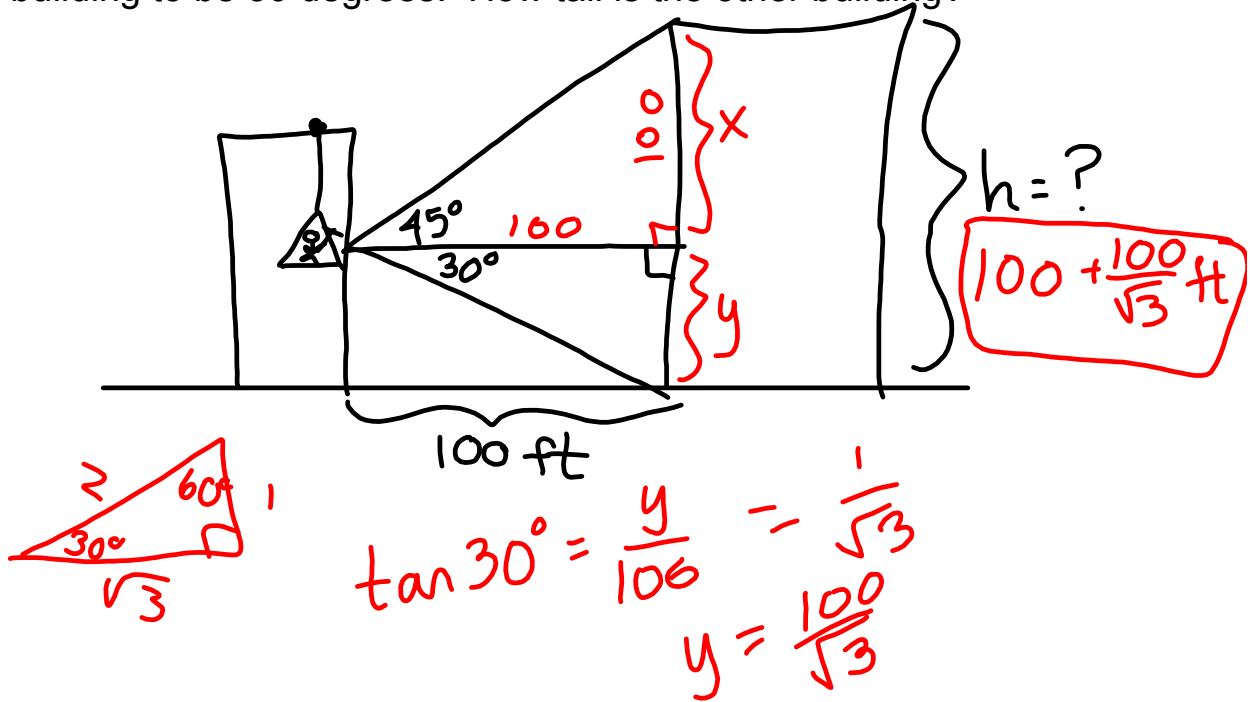
5.2 Applications of Right Triangles

A botanist stands 40 ft. from the base of a tree and estimates the angle of elevation to the tree's peak to be 70 degrees. How tall is the tree?

$$\tan 70° = \frac{h}{40\,ft}$$

$$\boxed{h = 40\tan 70°\ ft}$$

** Angles of elevation and depression are always measured from the horizontal

$h = ?$

$70°$
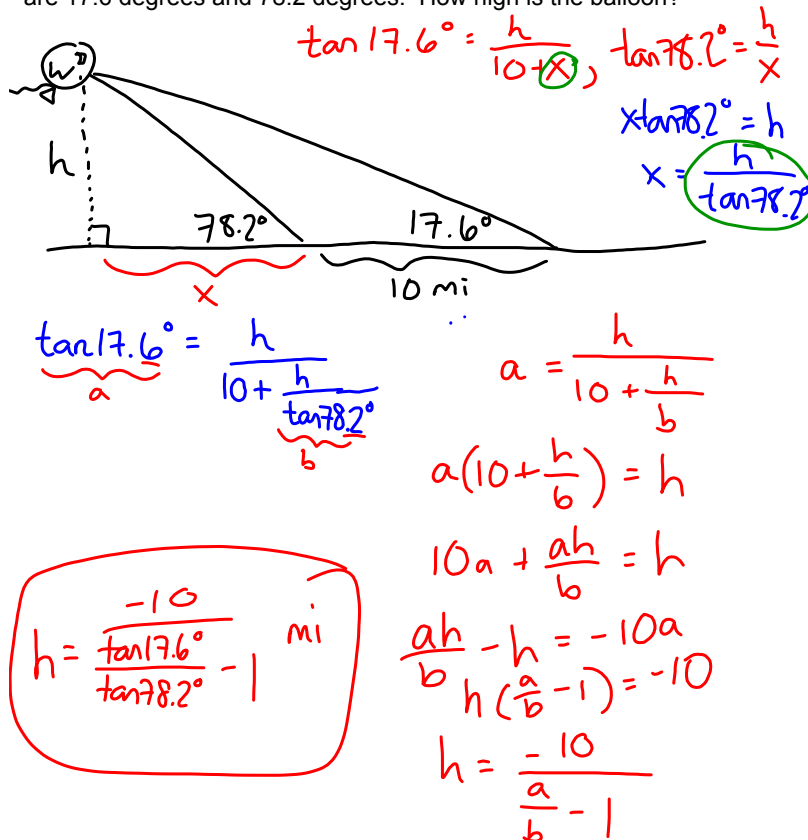
$40\,ft$

1

A window washer on the side of one building, 100 feet from another building, measures the angle of elevation of the top of the other building to be 45 degrees, and the angle of depression to the bottom of the other building to be 30 degrees. How tall is the other building?

$$45°$$ $$100$$ $$\{X$$ $$\{^{100}$$ $$h = ?$$

$$30°$$ $$\{y$$

$$100 + \frac{100}{\sqrt{3}} ft$$

$$100 ft$$

$$60°$$ $$1$$
$$2 \quad 30°$$
$$\sqrt{3}$$

$$\tan 30° = \frac{y}{100} = \frac{1}{\sqrt{3}}$$

$$y = \frac{100}{\sqrt{3}}$$

A weather balloon is directly west of two observing stations that are 10 miles apart. The angles of elevation of the balloon from the two stations are 17.6 degrees and 78.2 degrees. How high is the balloon?

$$\tan 17.6° = \frac{h}{10 + (X)}, \quad \tan 78.2° = \frac{h}{X}$$

$$X \tan 78.2° = h$$

$$X = \frac{h}{\tan 78.2°}$$

$$h$$ $$78.2°$$ $$17.6°$$

$$X \qquad 10 \, mi$$

$$\tan 17.6° = \frac{h}{10 + \frac{h}{\tan 78.2°}}$$
$$\underset{a}{\underbrace{\quad}} \qquad \underset{b}{\underbrace{\quad}}$$

$$a = \frac{h}{10 + \frac{h}{b}}$$

$$a\left(10 + \frac{h}{b}\right) = h$$

$$10a + \frac{ah}{b} = h$$

$$h = \frac{\frac{-10}{\tan 17.6°}}{\tan 78.2°} - 1 \quad mi$$

$$\frac{ah}{b} - h = -10a$$

$$h\left(\frac{a}{b} - 1\right) = -10$$

$$h = \frac{-10}{\frac{a}{b} - 1}$$

Due Wednesday, 8/20:
"Do you know enough Algebra..." take-home quiz

HW #2 due Friday 8/22:
- 5.2 #1-75odd

Test #1 ~ Wed, 8/27