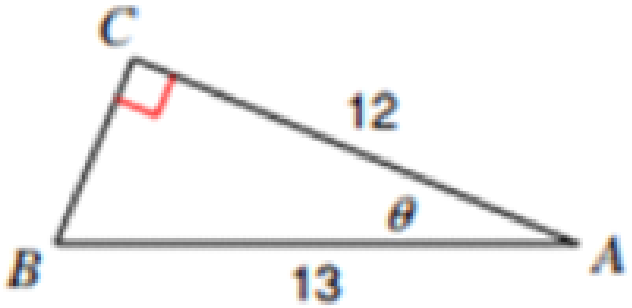
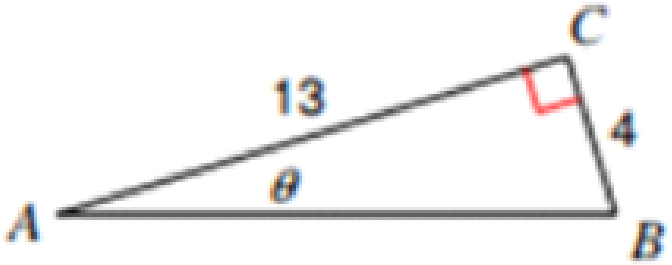
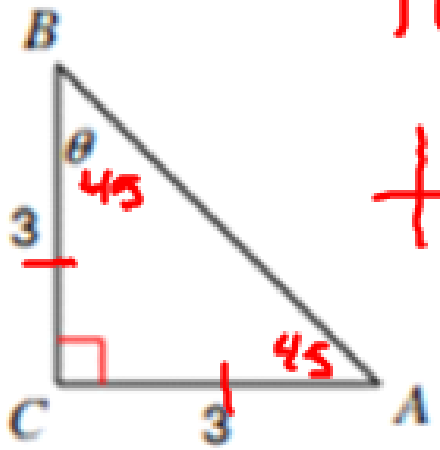




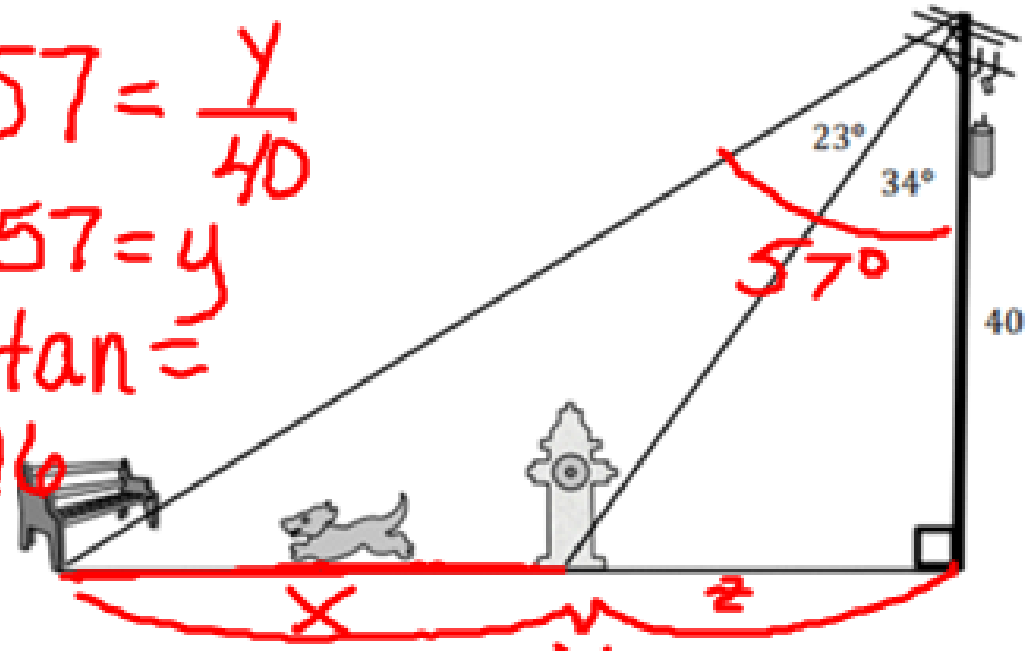


$$\tan\theta = \frac{3}{3}$$

$$\tan^{-1}\theta = 1$$

$$\theta = 45^\circ$$

The picture below shows the path that Puppy Liz is running. The electrical post is 40 feet tall. Puppy Liz usually starts at the bench post and runs until she gets to the fire hydrant, rests, and then she runs back to the bench. How far does Puppy Liz run to get to the fire hydrant?



$\tan 57 = \frac{y}{40}$

$40\tan 57 = y$

$40 * 57 \tan =$

$y = 61.5946$

$\tan 34 = \frac{z}{40}$

$40\tan 34 = z$

$40 * 34 \tan =$

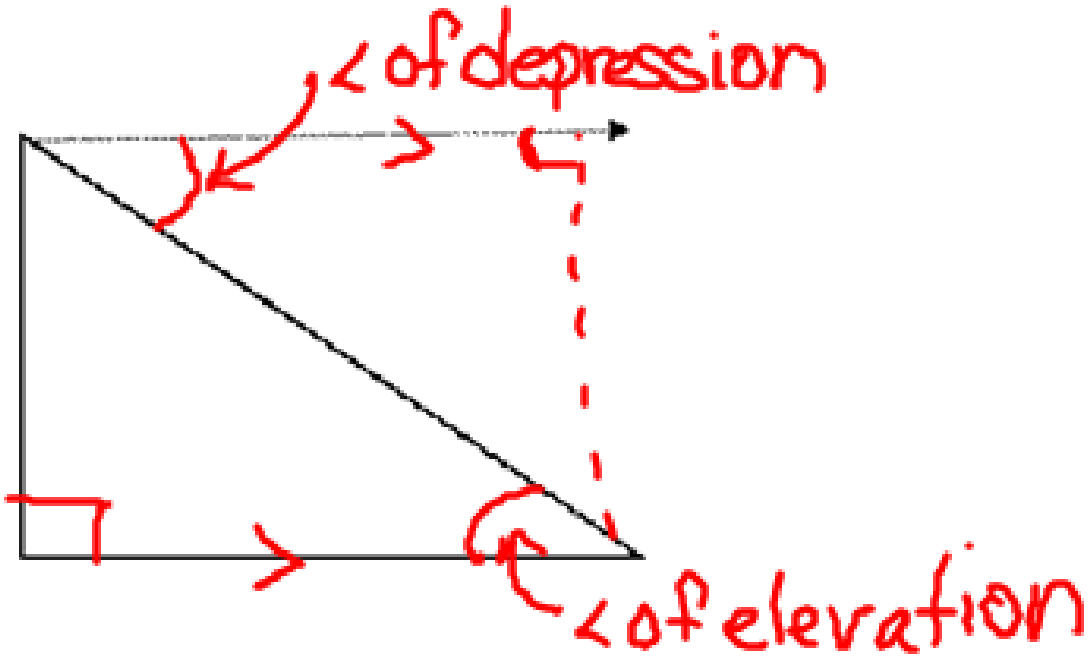
$z = 26.9803$

Puppy Liz runs 34.6 feet.

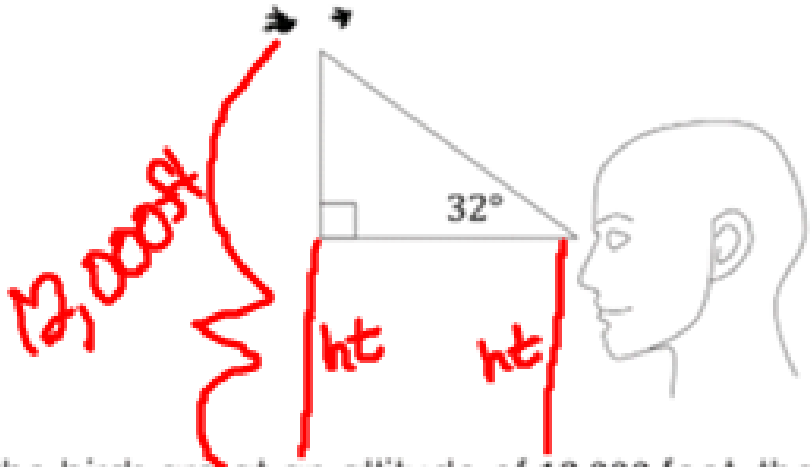
$61.5946 - 26.9803$

Angle of Elevation

Angle of Depression



Suppose that you see a flock of birds at an angle of elevation of 32°.



If the birds are at an altitude of 12,000 feet, then what does this mean with regards to angles of elevation or depression?

Subtraction

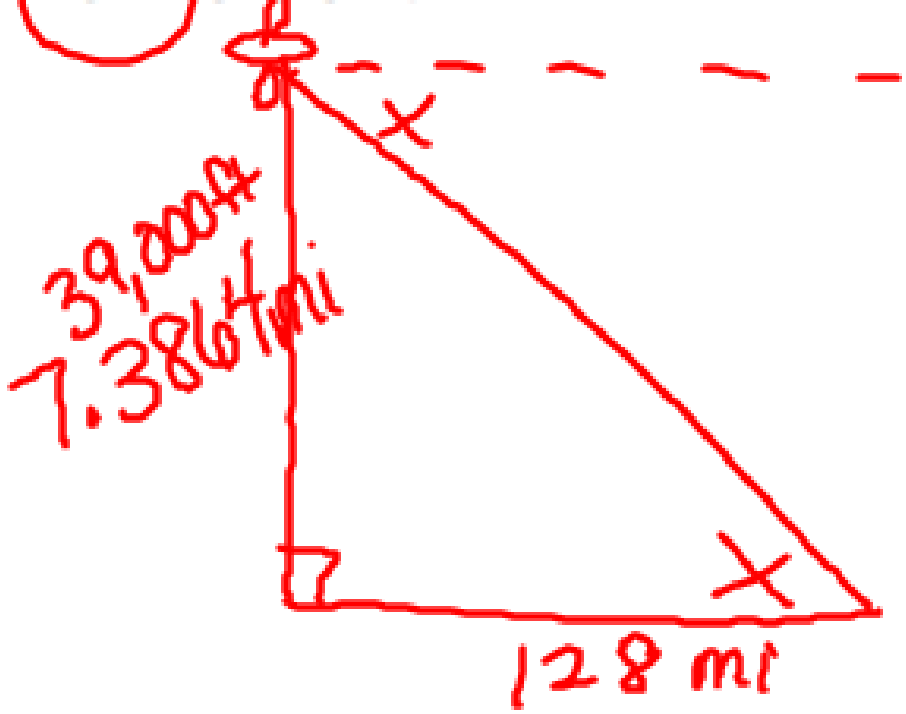
If your eye level is 6 feet above the ground, then what is the vertical distance from your eyes to the birds?

11,994 ft

How can you use this information to find your horizontal distance from the birds?

$\tan 32 = \frac{11,994}{x}$

1. Suppose that an airplane is currently flying at an altitude of 39,000 feet and will be landing on a tarmac 128 miles away. Find the average angle at which the airplane must descend for landing. Round your answer to the nearest tenth of a unit.



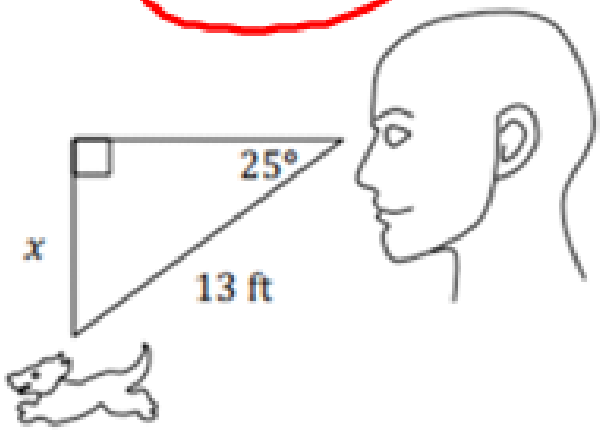
$\frac{5280\text{ft}}{39{,}000\text{ft}} = \frac{1\text{mi}}{x\text{mi}}$

$\tan x = \frac{7.3864}{128}$

$\tan^{-1} x = 0.0577$

$\angle x = 3.3$

2. Consider the diagram below that represents someone's eye level as he looks at his dog. Find the value of x, and round to the nearest hundredth of a foot.



$$\sin 25 = \frac{x}{13}$$

$$13 \sin 25 = x$$

$$13 * 25 \sin = 5.50$$