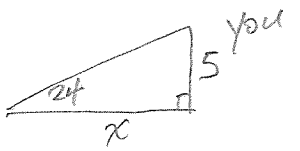
WORKSHEET: USING TRIG. RATIOS TO SOLVE WORD PROBLEMS

KEY

Draw a picture, write and solve an equation, and answer the question being asked the following problems. Round all distances to the nearest tenth and angle measures to the nearest degree.

1.) An ant is looking up at you with an angle of elevation of 24°. You are 5 feet tall. How far is the ant from your foot?



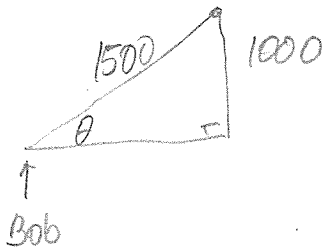
$\tan 24 = \frac{5}{x}$

$x = \frac{5}{\tan 24}$

$x \approx 11.2302$

11.2 feet

2.) Bob is looking at a helicopter that is flying 1,000 feet above the ground. Bob is 1500 feet from the helicopter. What angle of elevation is Bob looking at the helicopter?

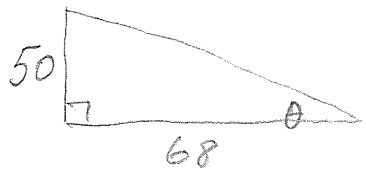


$\sin\theta = \frac{1000}{1500}$

$m\angle\theta = 41.8103$

Angle of elevation $\approx 42°$

3.) A building 50 feet high casts a shadow 68 feet long. Find the measure of the angle of elevation of the sun.

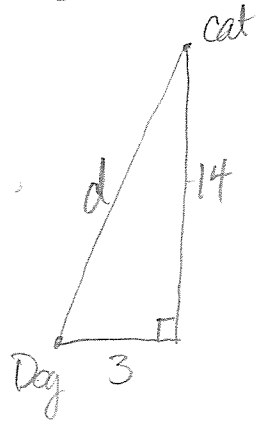


$\tan\theta = \frac{50}{68}$

$m\angle\theta \approx 36.3268$

Angle of elevation $\approx 36°$

4.) A dog chased a cat up a tree. The cat is 14 feet up the tree. If the dog is standing 3 feet from the tree, what is the distance from the cat to the dog?

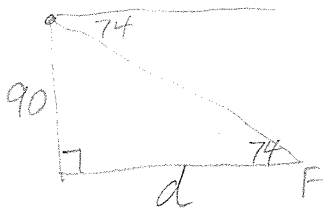


$3^2 + 14^2 = d^2$

$d \approx 14.3178$

distance from cat to dog $\approx$ 14.3 feet

5.) From the top of a tower, the angle of depression to a flower on the ground is 74°. The top of the tower is 90 feet above the ground. How far is the flower om the foot of the tower?

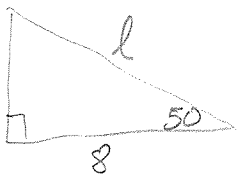


$\tan 74 = \frac{90}{d}$

$d = \frac{90}{\tan 74} \approx 25.8071$

About 25.8 ft.

6.) A fireman's ladder leaning against a house makes an angle of 50° with the ground. How long is the ladder if the ladder is 8 feet from the foot of the house?



$\cos 50 = \frac{8}{l}$

$l = \frac{8}{\cos 50}$

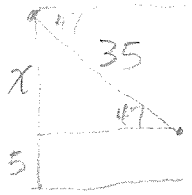
$l \approx 12.446$

ladder ≈ 12.4 ft.

7.) You are standing on a cliff that is 400 feet tall. You throw your geometry book off the cliff. The book lands 300 feet from the base of the cliff. How far is the book now from you?

d = 500 feet

8.) Cathy is flying a kite. The kite has an angle of depression of 47° and is flying on 35 feet of string. If Cathy is holding the end of the string 5 feet off the ground, how high above the ground is the kite?

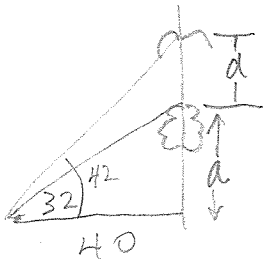


$\sin 47 = \frac{x}{35}$

$x \approx 25.5974$

Kite ≈ 30.6 feet above ground

9.) A bird is flying above a tree. You are standing 40 feet away from the tree. The angle of elevation to the top of the tree is 32°, and the angle of elevation to the bird is 42°. What is the distance from the bird to the top of the tree?



$\tan 32 = \frac{a}{40}$

$a \approx 24.9948$

$\tan 42 = \frac{d + 24.9948}{40}$

$36.01616 = d + 24.9948$

$d \approx 11.0214$

distance bet bird & tree ≈ 11.0 feet