

Name: My Period: _____ Date: _____

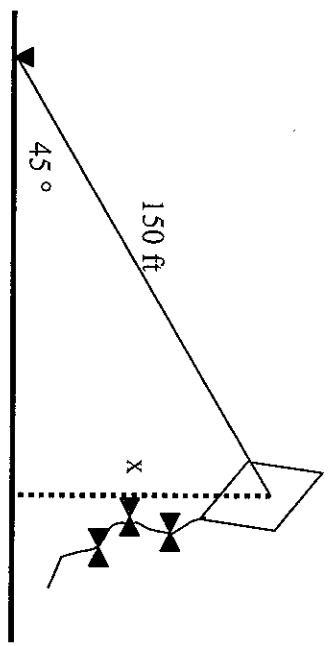
SOHCAHTOA

Worksheet – Angles of Depression and Elevation

- 1) A kite with a string 150 feet long makes an angle of 45° with the ground. Assuming the string is straight, how high is the kite?

$$\sin 45 = \frac{x}{150}$$

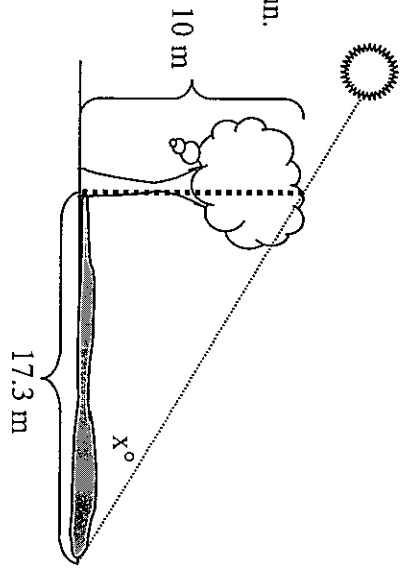
$$100 \text{ ft} = x$$



- 2) A tree 10 meters high casts a 17.3 meter shadow. Find the angle of elevation of the sun.

$$\tan x = \frac{10}{17.3}$$

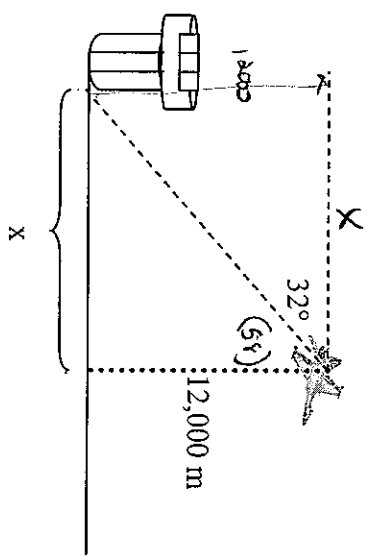
$$x = 30^\circ$$



- 3) A plane is flying at an altitude of 12,000 m. From the pilot, the angle of depression to the airport tower is 32° . How far is the tower from a point directly beneath the plane?

$$\tan 32 = \frac{12000}{x} \quad \text{OR} \quad \tan 58 = \frac{x}{12000}$$

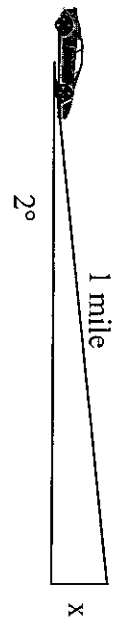
$$19204 = x$$

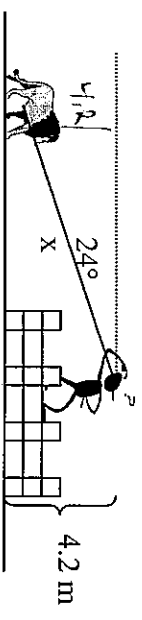


- 4) A car is traveling up a slight grade with an angle of elevation of 2° . After traveling 1 mile, what is the vertical change in feet? (1 mile = 5,280 ft)

$$\sin 2 = \frac{x}{1 \text{ mile}}$$

$$0.03 \approx x \quad \approx 184 \text{ ft}$$





- 5) From the top of a fence, a person spots a lion on the ground at an angle of depression of 24° . If the man and the fence is 4.2 meters high, how far is the man from the lion?

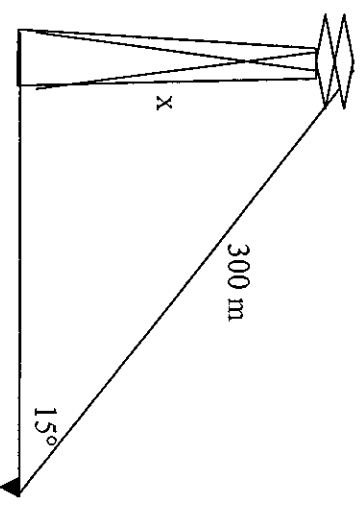
$$\sin 24 = \frac{4.2}{x}$$

$$10 \approx x$$

- 6) A 300 m cable is attached to the top of an antenna. The angle of elevation to the top of the antenna is 15° . How high is the antenna?

$$\sin 15 = \frac{x}{300}$$

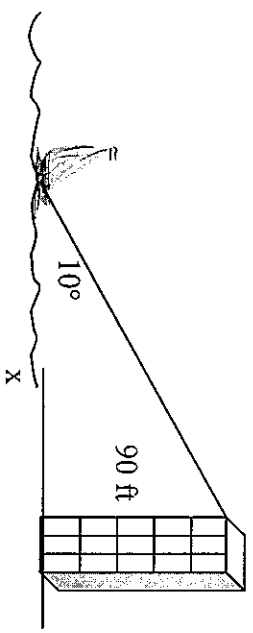
$$78 \approx x$$



- 7) The angle of elevation from a boat to the top of a 90 meter hotel is 10° . How far is the boat from the base of the hotel?

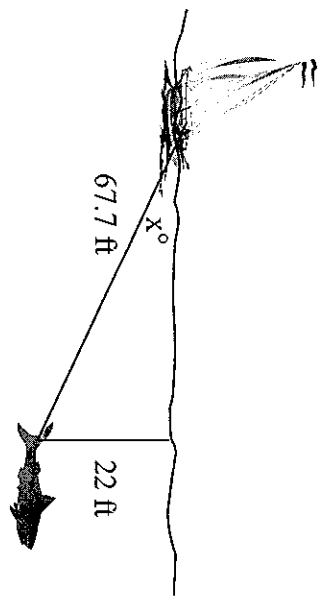
$$\tan 10 = \frac{90}{x}$$

$$510 \approx x$$



- 8) A great white shark swims 22 feet below sea level. If the shark is 67.7 feet from the sailboat, what is

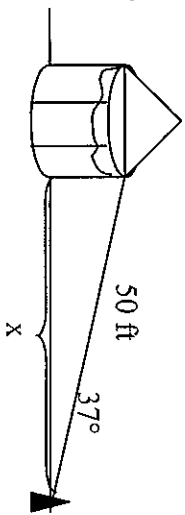
the angle of depression of the boat to the shark?



$$\sin x = \frac{22}{67.7}$$

$$x \approx 19^\circ$$

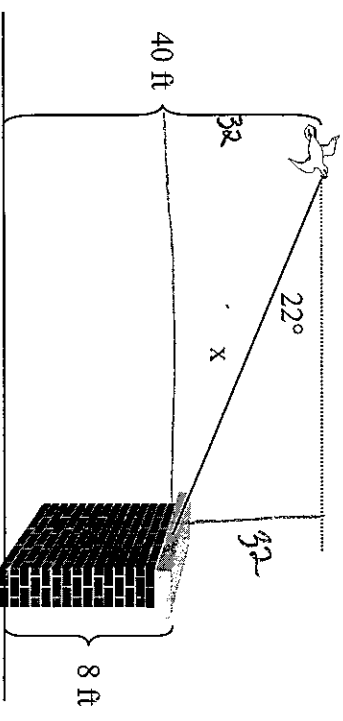
- 9) If a 50 foot cable supporting a circus tent is staked into the ground at an angle of elevation of 37° , how far from the tent must the stake be placed?



$$\cos 37 = \frac{x}{50}$$

$$40 \approx x$$

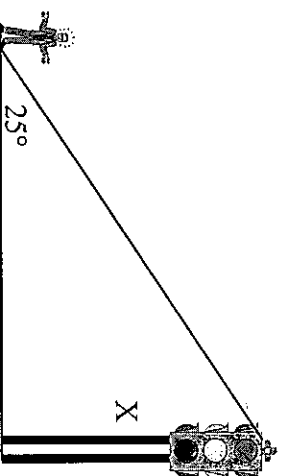
- 10) A bird is flying at a height of 40 feet and spots an 8-ft ledge on which to perch. If the top of the ledge is at a 22° angle of depression from the bird, how far must the bird fly before it can land? (Careful!)



$$\sin 22 = \frac{32}{x}$$

$$85 \approx x$$

- 11) A person is standing 30 meters from a traffic light. If the angle of elevation from the person's feet to the top of the traffic light

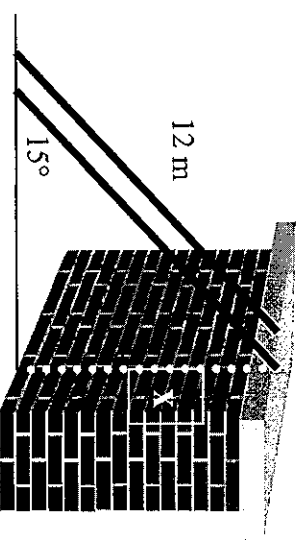


is 25° , find the height of the traffic light.

$$\tan 25 = \frac{x}{30}$$

$$14 \approx x$$

- 12) A 12 meter ladder is inclined against a brick wall at an angle of 15° . If the top of the ladder reaches the top of the wall, how tall is the wall?



$$\sin 15 = \frac{x}{12}$$

$$3 \approx x$$

SOHCATHOA

Honors Geometry
8-7 Word Problems

Name Mary

1. A ski slope has an angle of elevation of 15.7° and a vertical drop of 1800 feet. Estimate the length of the run.

$$\sin 15.7 = \frac{1800}{x}$$

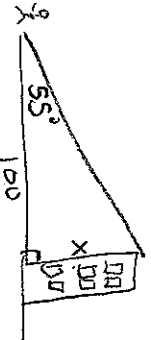
1. 6652 ft



2. A surveyor stands 100 feet from a building and sights the top of the building at a 55° angle of elevation. Find the height of the building.

$$\tan 55 = \frac{x}{100}$$

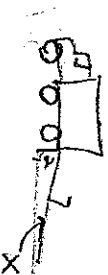
2. 143 ft



3. In order to move into her college apartment, Mrs. Laird rented a Uhaul truck. The tailgate on the back of the truck is 2 feet above the ground and the ramp leading up to the truck from the ground is 7 feet long. Find the incline of the ramp used for loading furniture on the truck.

$$\sin x = \frac{2}{7}$$

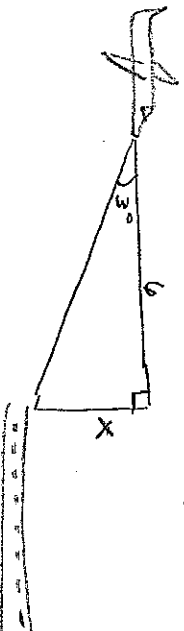
3. 17°



- * 4. When landing, a jet will average a 3° angle of descent. What is the altitude of a jet as it nears the landing when it passes over an airport 6 miles from the start of the runway?

$$\tan 3 = \frac{x}{6}$$

4. .314 mi
~1600 ft?



5. The Aerial run (ski slope in Utah) has a vertical drop of 2900 feet and is approximately 8399 feet long. What is the angle of depression? Would you classify this slope as a "beginner (bunny) slope" or "black diamond"?

$$\sin x = \frac{2900}{8399}$$

5. 20°

