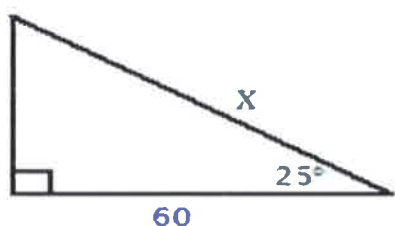


Name: _____ ANSWER KEY _____ Hour: _____ Date: _____

Angles of Elevation and Depression Assignment #1

Solve the following problems. Round the segment lengths to 2 places past the decimal and angle measures to the nearest whole degree. For each problem, draw and label a picture AND set up and solve the appropriate trigonometric ratio.

1. A slide has an angle of elevation of 25° . It is 60 feet from the end of the slide to the stairway beneath the top of the slide. About how long is the slide?

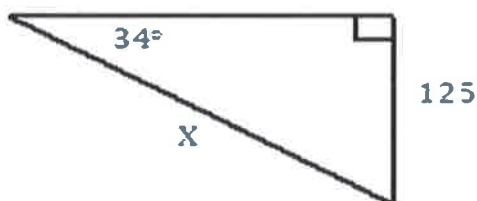


$$\cos 25 = \frac{60}{X}$$

$$X \cos 25 = 60$$

$$X = \frac{60}{\cos 25} \approx 66.20 \text{ ft}$$

2. A park ranger is standing on the top of a 125m hill looking down at a tree. She measures the angle of depression from where she is standing to the base of the tree as 34° . About how far away is the tree?

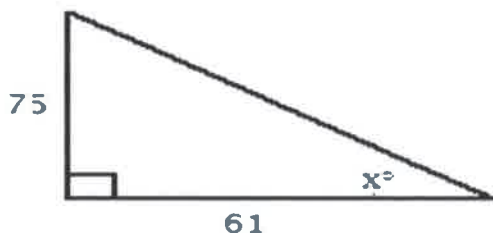


$$\sin 34 = \frac{125}{X}$$

$$X = \frac{125}{\sin 34}$$

$$X = 223.54 \text{ m}$$

3. A building that is 75 feet tall casts a shadow that is 61 feet long. What is the angle of elevation that the sun makes with the ground?

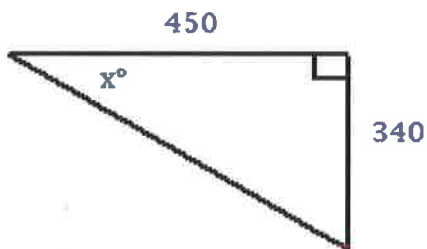


$$\tan x = \frac{75}{61}$$

$$\tan^{-1}\left(\frac{75}{61}\right) = x$$

$$x = 51^\circ$$

4. As viewed from a cliff 340 ft above sea level, a ship is 450 feet from the shore. What is the angle of depression from the cliff to the ship on the water below?

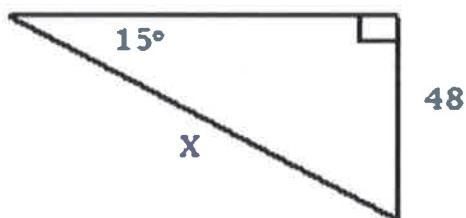


$$\tan x = \frac{340}{450}$$

$$\tan^{-1}\left(\frac{340}{450}\right) = x$$

$$x = 37^\circ$$

5. A moving sidewalk takes zoo visitors down a hill. The sidewalk drops 48 feet. Its angle of depression is 15° . About how long is the side walk?

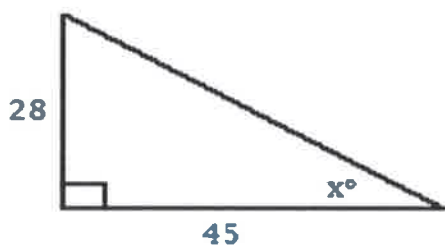


$$\sin 15 = \frac{48}{x}$$

$$x = \frac{48}{\sin 15}$$

$$x = 185.46 \text{ ft}$$

6. If a tree 28 feet tall casts a shadow of 45 feet, what angle do the rays of the sun meet the ground at?

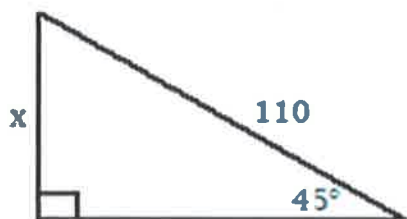


$$\tan x = \frac{28}{45}$$

$$\tan^{-1}\left(\frac{28}{45}\right) = x$$

$$x = 32^\circ$$

7. The angle of elevation of a 110 foot crane is 45° . How high can the crane raise building material?

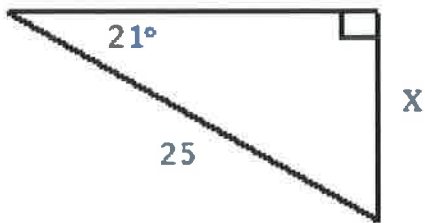


$$\sin 45 = \frac{x}{110}$$

$$110 (\sin 45) = x$$

$$x = 77.78 \text{ ft}$$

8. A truck drives down a 25-meter decline. The angle of depression of the decline is 21° . How high is the truck above ground level?

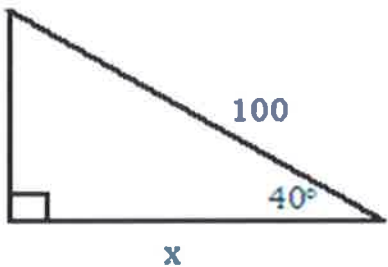


$$\sin 21 = \frac{x}{25}$$

$$25 (\sin 21) = x$$

$$x = 8.96 \text{ ft}$$

9. A boy flying a kite lets out 100 feet of string making an angle of elevation of 40° . How far away is a point on the ground directly under the kite?

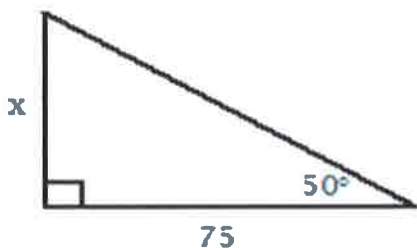


$$\cos 40 = \frac{x}{100}$$

$$100 (\cos 40) = x$$

$$x = 76.60 \text{ ft}$$

10. At 8:00 am, a building casts a shadow 75 feet long. The angle where the ray from the sun met the ground is 50° . How tall is the building?

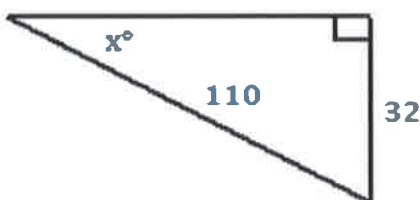


$$\tan 50 = \frac{x}{75}$$

$$75 (\tan 50) = x$$

$$x = 89.38 \text{ ft}$$

11. An escalator from the second floor to the ground floor of a department store is 110 feet long and falls 32 feet vertically. What angle does the escalator make with the second floor?

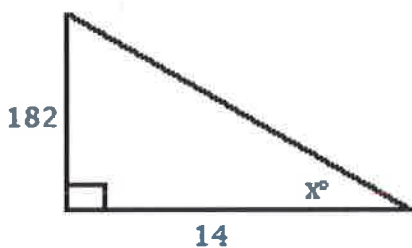


$$\sin x = \frac{32}{110}$$

$$\sin^{-1}\left(\frac{32}{110}\right) = x$$

$$x = 17^\circ$$

12. A rock that is dropped 182 feet from the top of the Leaning Tower of Pisa falls to a point 14 feet from the tower base. What angle does the tower make with the ground?



$$\tan x = \frac{182}{14}$$

$$\tan^{-1}\left(\frac{182}{14}\right) = x$$

$$x = 86^\circ$$