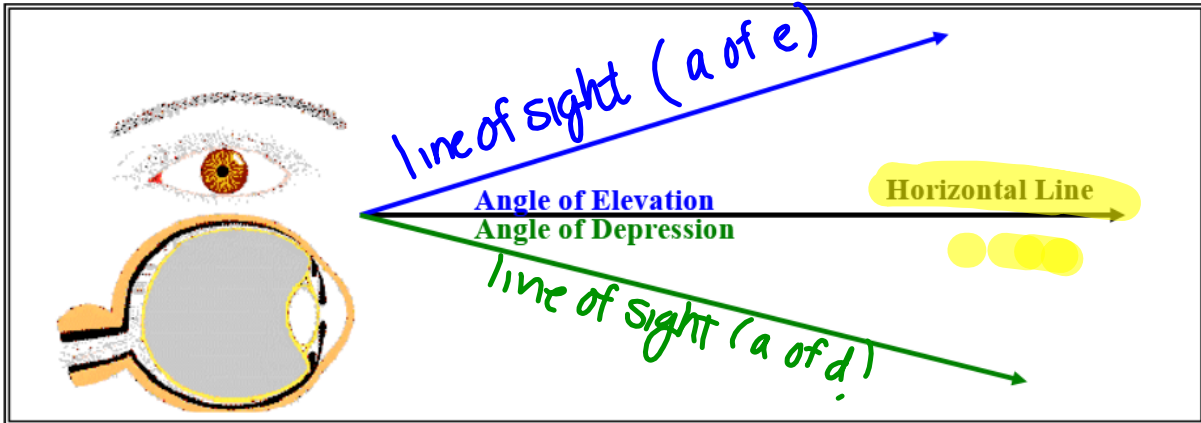


Class-Notes

Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Ch#7.6. B: Angles of Elevation & Depression

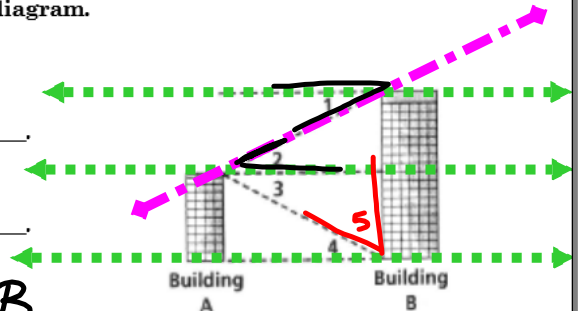
\*Angle of elevation: is the angle between the line of sight and the horizontal when an observer looks upwards.



\*Angle of depression: is the angle between the line of sight and the horizontal when an observer looks downward.

**Example 1:** Describe each angle as it relates to the diagram.

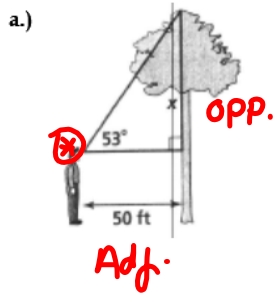
- $\angle 1$ : is an  $\angle$  of depression from top of building B to top of building A.
- $\angle 2$ : is an  $\angle$  of elevation from top of building A to top of building B.
- $\angle 3$ : is an  $\angle$  of depression from top of building A to bottom of building B.
- $\angle 4$ : is an  $\angle$  of elevation from bottom of building B to top of building A.



➤ Notice:  $\angle 3$  is ≅ to  $\angle 4$  because they are alternate interior angles.

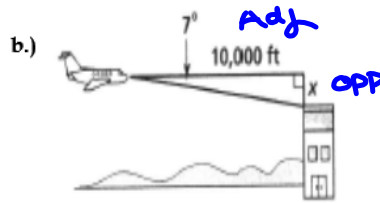
$S = O/H$     $C = A/H$     $T = O/A$

**Example 2:** Find the value of x. Round your answer to the nearest tenth.



$$\frac{\tan 53^\circ}{1} = \frac{x}{50 \text{ ft}}$$

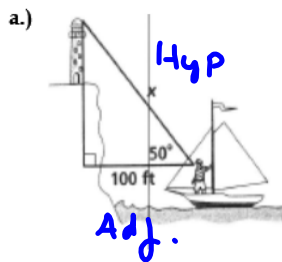
$$x = 50 \tan 53^\circ = 66.4 \text{ ft}$$



$$\frac{\tan 7^\circ}{1} = \frac{x}{10,000 \text{ ft}}$$

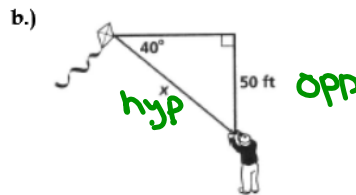
$$x = 10,000 \tan 7^\circ = 1227.8 \text{ ft}$$

**Example 3:** Find the value of x. Round your answer to the nearest tenth.



$$\frac{\cos 50^\circ}{1} = \frac{100}{x}$$

$$x \cdot \frac{\cos 50^\circ}{\cos 50^\circ} = \frac{100}{\cos 50^\circ} = 155.6 \text{ ft}$$

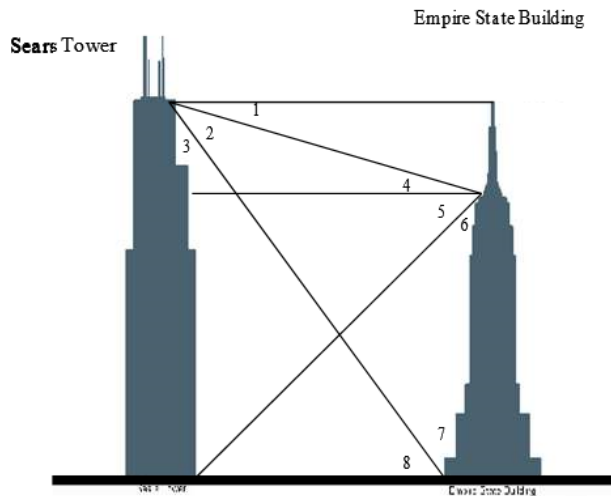


$$\frac{\sin 40^\circ}{1} = \frac{50 \text{ ft}}{x}$$

$$x = \frac{50}{\sin 40^\circ} = 77.8 \text{ ft}$$

**Example 4: Describe each angle.**

- ∠1: depression
- ∠2: neither
- ∠3: neither
- ∠4: elevation
- ∠5: depression
- ∠6: neither
- ∠7: neither
- ∠8: elevation

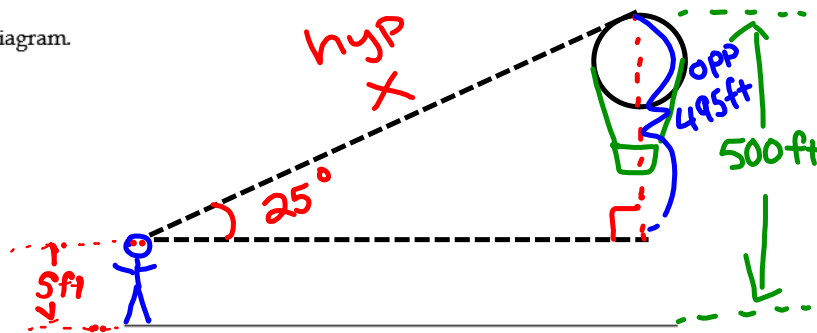


**Assignment: Word Problems**

**Examples:**

1. A hot-air balloon is flying 500 ft above the ground. A person on the ground sees the hot-air balloon by looking at 25° angle. The person's eye level is 5 ft above the ground.

a.) Draw a diagram.



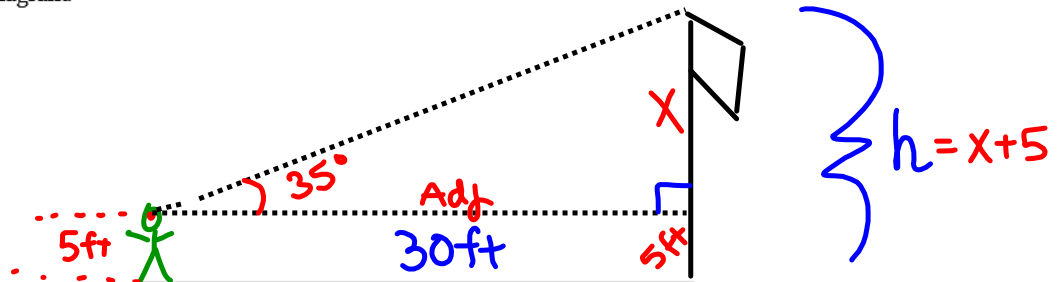
b.) Find the distance from the hot-air balloon to the person. Round your answer to the nearest foot.

$$\frac{\sin 25^\circ}{1} = \frac{495 \text{ ft}}{X}$$

$$\frac{X \cdot \sin 25^\circ}{\sin 25^\circ} = \frac{495 \text{ ft}}{\sin 25^\circ} = 1171.3 \text{ ft}$$

2. A person standing 30 ft from a flag pole can see the top of the pole at a  $35^\circ$  angle of elevation.

a.) Draw a diagram.



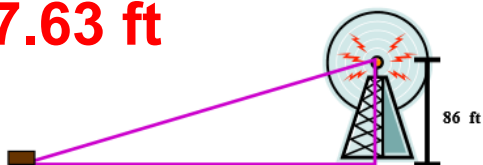
b.) The person's eye level is 5 ft from the ground.  
Find the height of the flag pole to the nearest foot.

**26 ft**

$\approx \approx \approx 26$

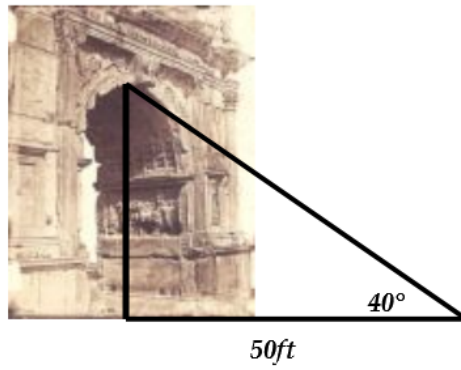
3. A worker is installing an emissions meter to measure the amount of extraneous noise emitted from a radio communications tower. The meter works best if its sensor's angle of elevation is  $32^\circ$  from the ground to the top of the tower. The tower is 86 feet high. How far from the tower should the meter be placed?

**137.63 ft**



4. How tall is the Roman Arch?

**41.95 ft**



**Homework: Finish problems.**