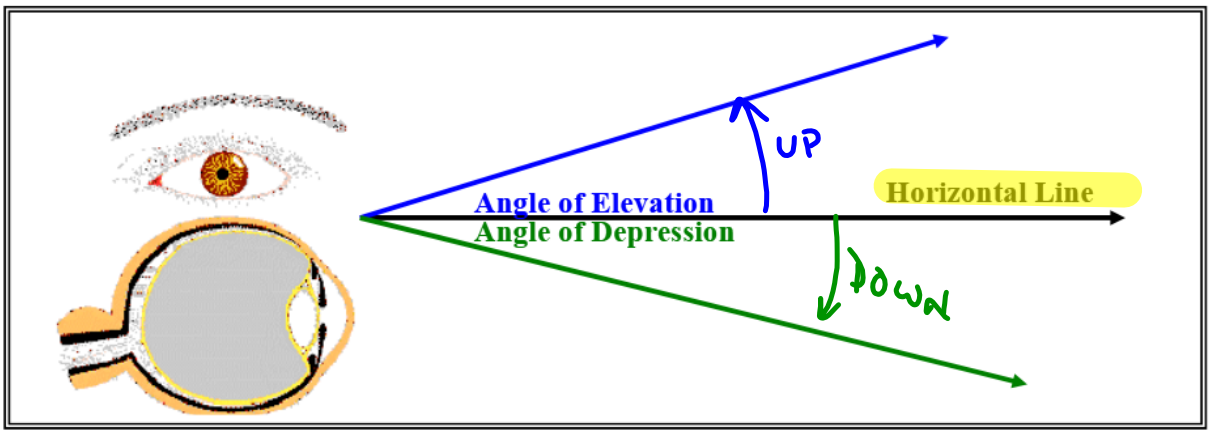
Class-Notes Date: _____ Period: _____

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* **up** .



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

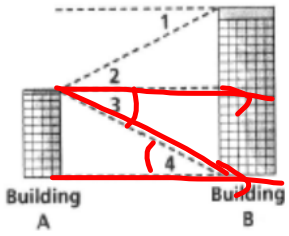
Example 1: **Describe each angle as it relates to the diagram.**

a.) ∠1 : *is an ∠ of* DEPRESSION *from top of building* B *to top of building* A .

b.) ∠2 : *is an ∠ of* ELEVATION *from top of building* A *to top of building* B .

c.) ∠3 : *is an ∠ of* DEPRESSION *from top of building* A *to bottom of building* B .

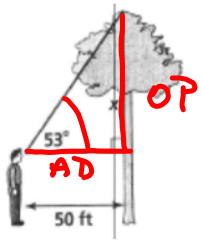
d.) ∠4 : *is an ∠ of* ELEVATION *from bottom of building* B *to top of building* A .



➢ *Notice:* ∠3 *is* ≅ *to* ∠4 *because they are* ALTERNATE *interior angles.*

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

a.)



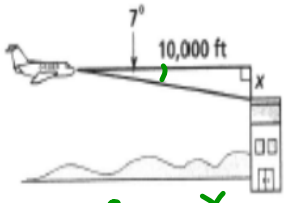
ELEV.
OP
AD

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

$x = 50(\tan 53^\circ)$

$x \approx 66.4\text{ ft}$

b.)



DEPR.

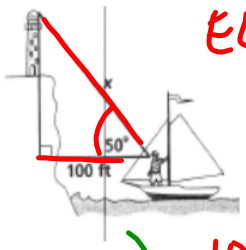
$\tan 7^\circ = \frac{x}{10{,}000}$

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

$x \approx 1227.8\text{ ft}$

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

a.)

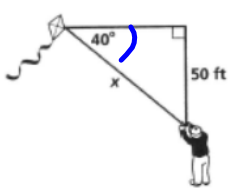


ELEV

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

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

b.)



DEPR.

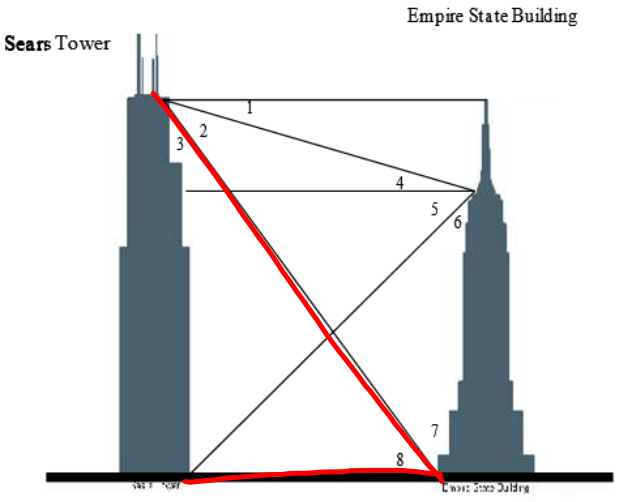
$\sin 40^\circ = \frac{50\text{ ft}}{x}$

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

Classify each angle as:

- angle of elevation
- angle of depression
- neither

Example 4:



∠1 : DEPRESSION

∠2 : NEITHER

∠3 : NEITHER

∠4 : ELEVATION

∠5 : DEPRESSION

∠6 : NEITHER

∠7 : NEITHER

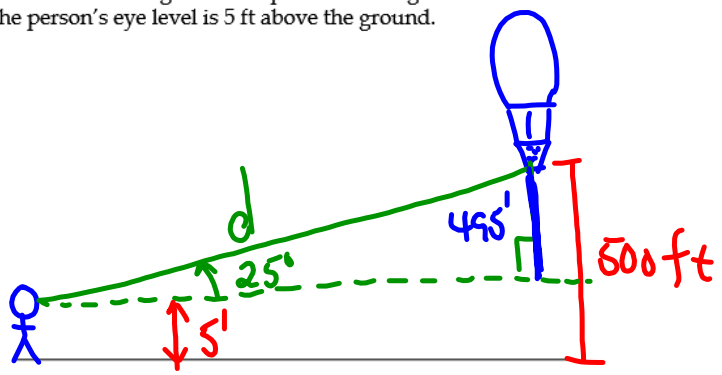
∠8 : ELEVATION

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.



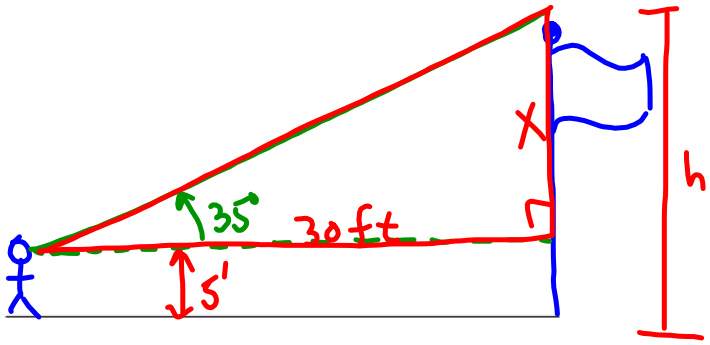
   b.) Find the distance from the hot-air balloon to the person. Round your answer to the nearest foot.

$d \approx 1171.27$ ft

$\sin 25^\circ = \frac{495}{d}$ $\quad d = \frac{495}{\sin 25^\circ}$

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

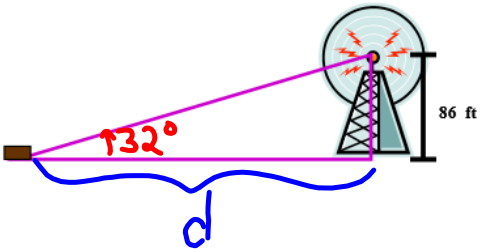
a.) Draw a diagram.



b.) The person's eye level is 5 ft from the ground.
Find the height of the flag pole to the nearest foot. $h \approx 26$ ft

$$\tan 35^\circ = \frac{x}{30} \rightsquigarrow x = 30\tan 35^\circ \approx 21' + 5' = 26\text{ft}$$

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° 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? $d \approx 137.63$ ft

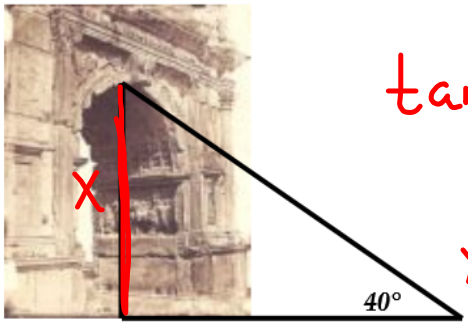


$$\tan 32^\circ = \frac{86\text{ft}}{d}$$

$$d = \frac{86\text{ft}}{\tan 32^\circ}$$

4. How tall is the Roman Arch? $h \approx 41.95$ ft

HEIGHT



$\tan 40^\circ = \frac{X}{50\text{ ft}}$

$X = 50 \cdot \tan 40^\circ \approx$

Homework: Finish problems.