

Name: Key

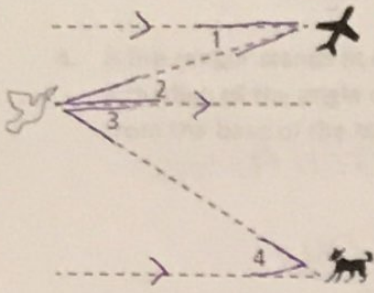
Date: 2/26/18

CC GEOMETRY

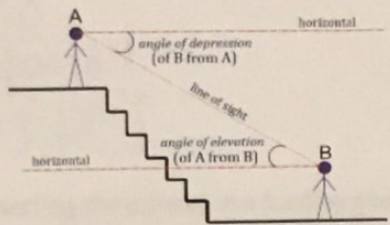
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LESSON #10: ANGLE OF ELEVATION/DEPRESSION

Do Now: Identify which angles are congruent to each other.



$\angle 1 \cong \angle 2$
 $\angle 3 \cong \angle 4$
 alt. int. \angle 's are \cong

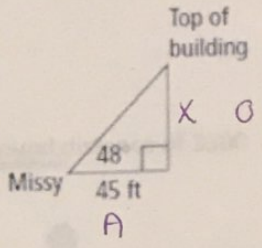


Angle of Elevation	Angle of Depression
The angle of elevation always located INSIDE & is measured from the BOTTOM of the triangle.	The angle of depression is always located OUTSIDE the triangle & is measured from TOP of the triangle.

THEOREM
 If lines are \parallel , then alt. int. \angle 's are \cong therefore, the angle of elevation \cong the angle of depression.

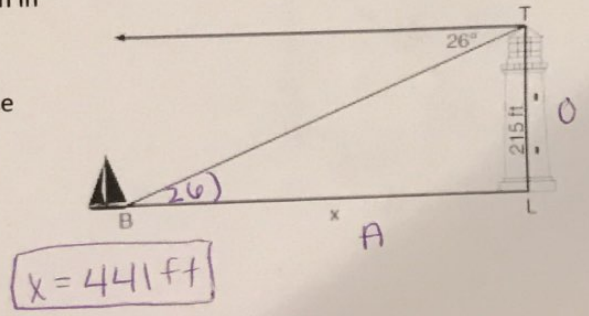
- Missy stands at a horizontal distance of 45 feet from the base of a building. The angle of elevation from Missy to the top of the building is 48 degrees. What is the height of the building to the nearest foot?

SOHCAHTOA $\tan 48 = \frac{x}{45}$ height = 50ft
 $x = 45 \tan 48$
 $x = 49.9775$



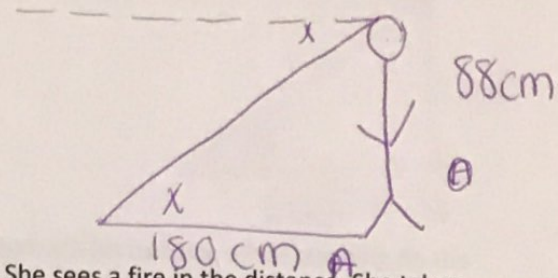
- The top of a lighthouse, T, is 215 feet above sea level, L, as shown in the diagram below. The angle of depression from the top of the lighthouse to a boat, B, at sea is 26 degrees. Determine, to the nearest foot, the horizontal distance, x, from the boat to the base of the lighthouse.

SOHCAHTOA $\tan 26 = \frac{215}{x}$
 $\frac{215}{\tan 26} = \frac{x \tan 26}{\tan 26}$
 $x = 440.8153$



3. Find to the nearest degree the measure of the angle of elevation of the sun if a child is 88 cm high and casts a shadow 180 cm long to the nearest tenth.

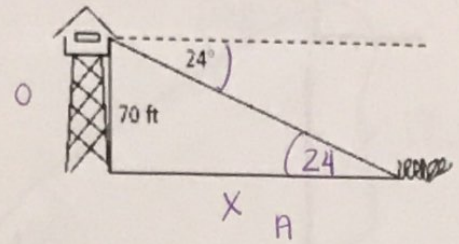
SOHCAHTOA
 $(\tan x)^{-1} = \left(\frac{88}{180}\right)^{-1}$
 $x = 26.1^\circ$



4. A fire ranger stands at an observation window 70 ft above the ground. She sees a fire in the distance. She takes a reading of the angle of depression and finds it to be 24 degrees. To the nearest tenth of a foot, how far away from the base of the tower is the fire?

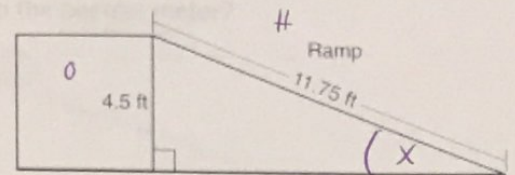
SOHCAHTOA

$\frac{\tan 24}{1} = \frac{70}{x}$
 $x \tan 24 = 70$
 $\frac{x \tan 24}{\tan 24} = \frac{70}{\tan 24}$
 $x = 157.2 \text{ ft}$



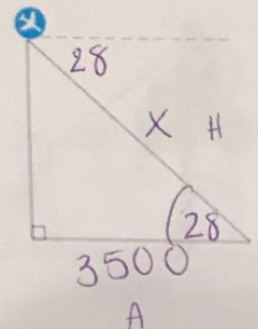
5. The diagram below shows a ramp connecting the ground to a loading platform 4.5 feet above the ground. The ramp measures 11.75 feet from the ground to the top of the loading platform. Determine and state, to the nearest degree, the angle of elevation formed by the ramp and the ground.

SOHCAHTOA
 $(\sin x)^{-1} = \left(\frac{4.5}{11.75}\right)^{-1}$
 $x = 22.5183$
 $x = 23^\circ$



6. The 747 is landing at JFK airport at an angle of depression of 28 degrees covering a ground distance of 3500 yards. Find, to the nearest yard, how far the plane travels on its descent.

SOHCAHTOA
 $\frac{\cos 28}{1} = \frac{3500}{x}$
 $\frac{3500}{\cos 28} = \frac{x \cos 28}{\cos 28}$
 $x = 3963.9951$
 $x = 3964 \text{ yards}$



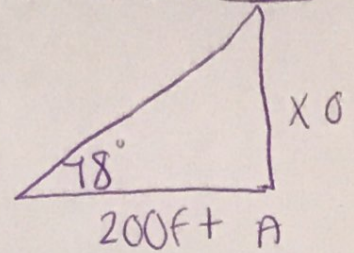
7. A wildlife biologist looks up at a 78 degree angle of elevation to see a flock of geese in the air. The biologist is standing 200 feet away from a place directly underneath the geese. How high are the geese flying to the nearest tenth of a foot?

SOHCAHTOA

$$\tan 78 = \frac{x}{200}$$

$$x = 200 \tan 78$$

$$x = 940.9 \text{ ft}$$



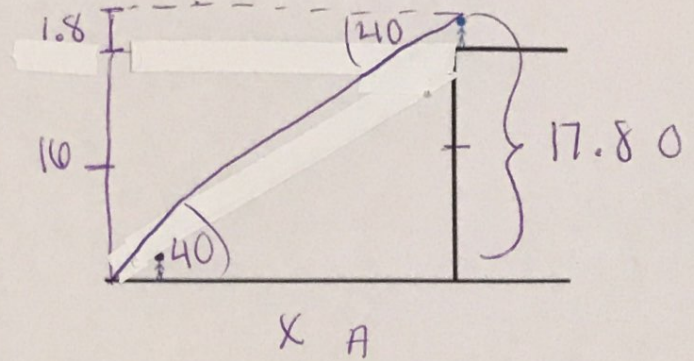
8. From an angle of depression of 40 degrees, John watches his friend approach his building while standing on the rooftop. The rooftop is 16 m from the ground, and John's eye level is at about 1.8 m from the rooftop. What is the distance between John's friend and the building to the nearest tenth?

SOHCAHTOA

$$\tan 40 = \frac{17.8}{x}$$

$$17.8 = x \tan 40$$

$$x = 21.2 \text{ m}$$



9. Standing on the gallery of a lighthouse (the deck at the top of the lighthouse), a person spots a ship at an angle of depression of 20 degrees. The lighthouse is 28 m tall and sits on a cliff 45 m tall as measured from sea level. What is the horizontal distance between the lighthouse and the ship to the nearest meter?

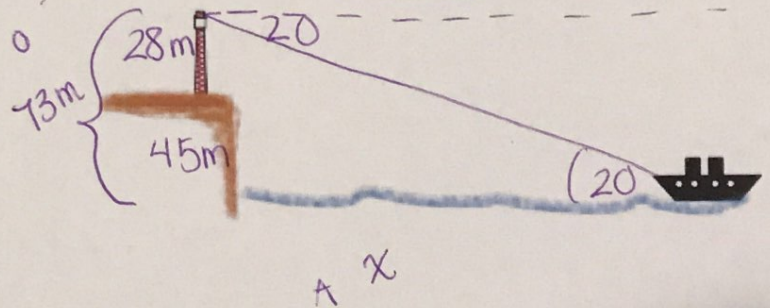
SOHCAHTOA

$$\tan 20 = \frac{73}{x}$$

$$73 = x \tan 20$$

$$x = 200.5058$$

$$x = 201 \text{ m}$$



10. Scott, whose eye level is 1.5 m above the ground, stands 30 m from a tree. Scott's angle of elevation is 36 degrees. How far above the ground is the bird, to the nearest tenth?

SOHCAHTOA

$$\tan 36 = \frac{x}{30}$$

$$x = 30 \tan 36$$

$$x = 21.7962$$

$$+1.5$$

$$23.2962 = 23.3 \text{ m}$$

