| **Angle of Elevation**	angle above the horizontal line
	ex) looking up from ground level toward the top of a tree
Angle of Depression	angle below the horizontal line
	ex) looking out of the top of a lighthouse at a boat below
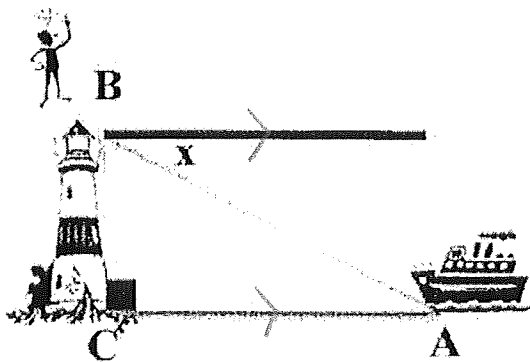
As seen in the diagram above, the dark black horizontal line is parallel to side CA of triangle ABC. This forms two alternate interior angles which are equal in measure. This tells us what?

angles of elevation and depression are
congruent
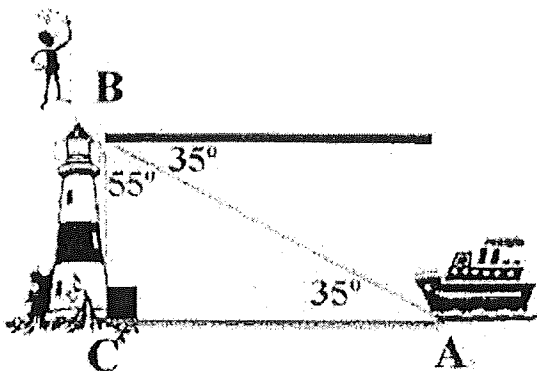
	There are two possible ways to use our **angle of depression** to obtain an angle INSIDE the triangle.
	1. Why is the adjacent angle 55°? B & C are consec. int (=180) & ∠C = 90 ∴ ∠B = 90 90 - 35 = 55°
	2. Why is angle A 35°? b/c ∠B ≅ ∠A

In Class Practice- Notes Angle of Elevation and Depression

1.

HIKING Ayana is hiking in a national park. A forest ranger is standing in a fire tower that overlooks a meadow. She sees Ayana at an <mark>angle of depression</mark> measuring 38°. If Ayana is 50 feet away from the base of the tower, which is closest to the height of the fire tower?
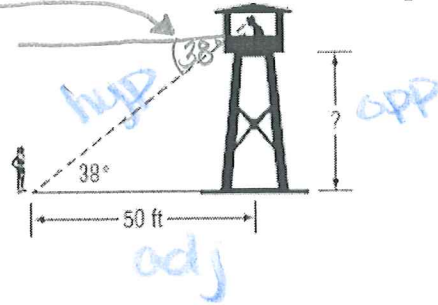
$\tan\theta = \frac{opp}{adj}$

$50 \cdot \tan 38 = \frac{x}{50} \cdot 50$

$x = 50 \tan 38$

$\boxed{x = 39.06 \text{ ft}}$

2. **SHADOWS** Find the <mark>angle of elevation</mark> of the Sun when a 7.6-meter flagpole casts a 18.2-meter shadow. Round to the nearest tenth of a degree.

$\tan\theta = \frac{opp}{adj}$

$\tan x = \frac{7.6}{18.2}$

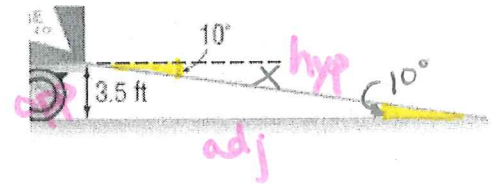$x = \tan^{-1}\left(\frac{7.6}{18.2}\right) = 22.66°$

$\boxed{x = 22.7°}$

3. The tailgate of a moving van is 3.5 feet above the ground. A loading ramp is attached to the rear of the van at an incline of 10°. What is the length of the ramp?
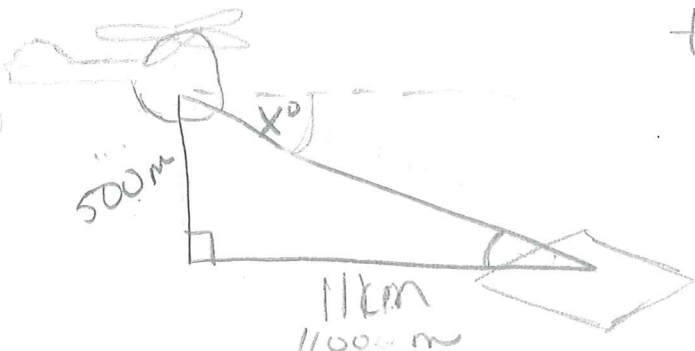
$\sin\theta = \frac{opp}{hyp}$

$x \cdot \sin 10 = \frac{3.5}{x} \cdot x$

$\frac{x \sin 10}{\sin 10} = \frac{3.5}{\sin 10}$

$\boxed{x = 20.16 \text{ ft}}$

4. **AVIATION** After flying at an altitude of 500 meters, a helicopter starts to descend when its ground distance from the landing pad is 11 kilometers. What is the <mark>angle of depression</mark> for this part of the flight?

$\tan\theta = \frac{opp}{adj}$

$\tan x = \frac{500}{11000}$

$x = \tan^{-1}\left(\frac{500}{11000}\right)$

$\boxed{x = 24.4°}$