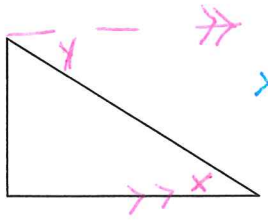
Key

Accelerated Geometry Notes: Section 8-5 Angles of Elevation and Depression.

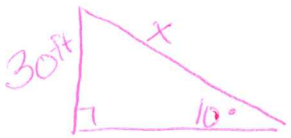


$x \cong Y$ by // lines form $\cong$ alt int $\angle$s.

Label the angle of Elevation X

Label the angle of Depression Y

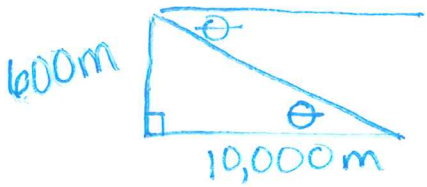
1. A dog chasing some birds in the woods got away from its owner. If the owner is 30 feet lower than the dog and the angle of elevation from the owner to the dog is 10°, find the distance from the owner to the dog. (This means they are on a hill)



$\sin 10 = \frac{30}{x}$

$x \approx 172.76 ft$

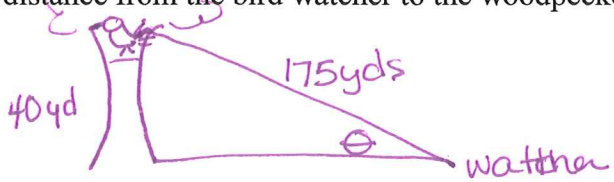
2. After flying at an altitude of 600 meters, a hot air balloon starts to descend when its ground distance from the landing pad is 10,000 meters. What is the angle of depression for this part of the flight?



$\theta = \tan^{-1}\left(\frac{600}{10000}\right)$

$\theta \approx 3.43°$

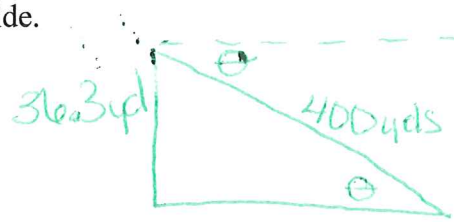
3. A bird watcher spied a woodpecker. The bird watcher is 40 yards lower than the woodpecker. The distance from the bird watcher to the woodpecker is 175 yards. What is the angle of elevation?



$\theta = \sin^{-1}\left(\frac{40}{175}\right)$

$\theta \approx 13.21°$

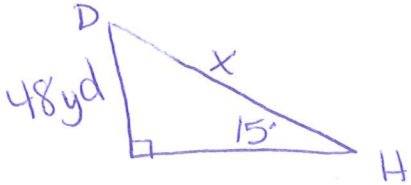
4. A water slide is 400 yards long with a vertical drop of 36.3 yards. Find the angle of depression of the slide.



$\theta = \sin^{-1}\left(\frac{36.3}{400}\right)$

$\theta \approx 5.21°$

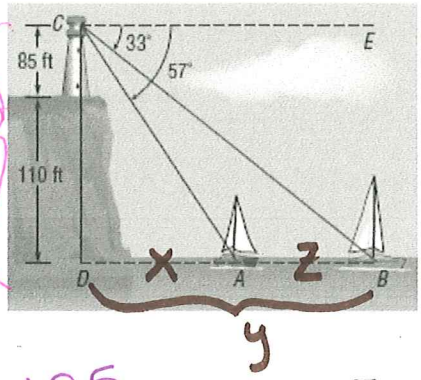
5. A hiker stops to rest and sees a deer in the distance. If the hiker is 48 yards lower than the deer and the angle of elevation from the hiker to the deer is 15°, find the distance from the hiker to the deer.

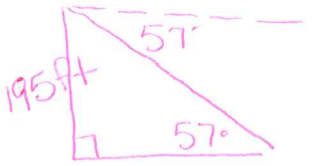


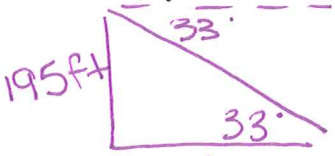
$\sin 15 = \frac{48}{x}$

$x \approx 185.46 yds$

6. Olivia works in a lighthouse on a cliff. She observes two sailboats due east of the lighthouse. The angles of depression to the two boats are 33° and 57°. Find the distance between the two sailboats to the nearest foot.







$\tan 57 = \frac{195}{x}$

$x \approx 126.63$ ft

$\tan 33 = \frac{195}{y}$

$y \approx 300.27$ ft

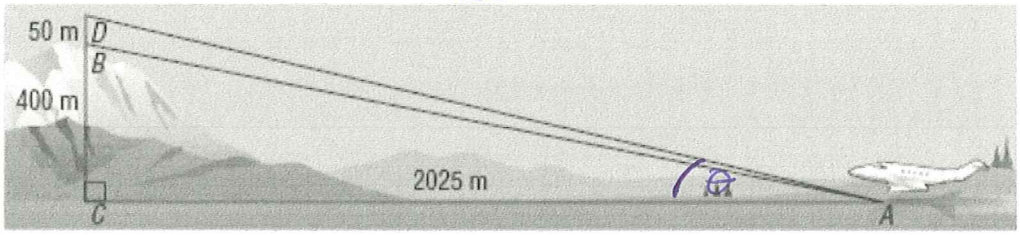
$z = y - x$

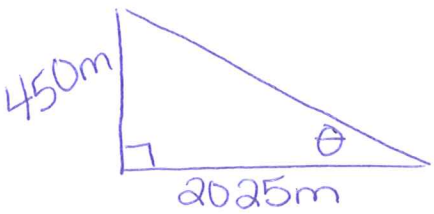
$z = 300.27 - 126.63$

$z \approx 173.64$ ft

rounded 174 ft

7. **AVIATION** The peak of Goose Bay Mountain is 400 meters higher than the end of a local airstrip. The peak rises above a point 2025 meters from the end of the airstrip. A plane takes off from the end of the runway in the direction of the mountain at an angle that is kept constant until the peak has been cleared. If the pilot wants to clear the mountain by 50 meters, what should the angle of elevation be for the takeoff to the nearest tenth of a degree?





$\theta = \tan^{-1}\left(\frac{450}{2025}\right)$

$\theta \approx 12.5°$