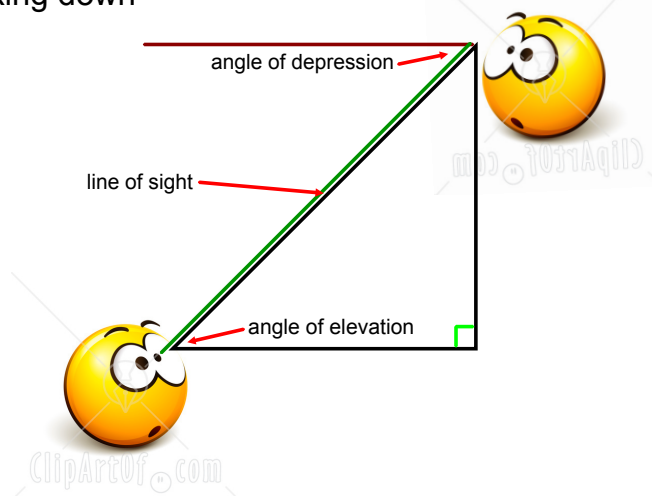


7-5 Angles of elevation
and depression**Angle of Elevation:**

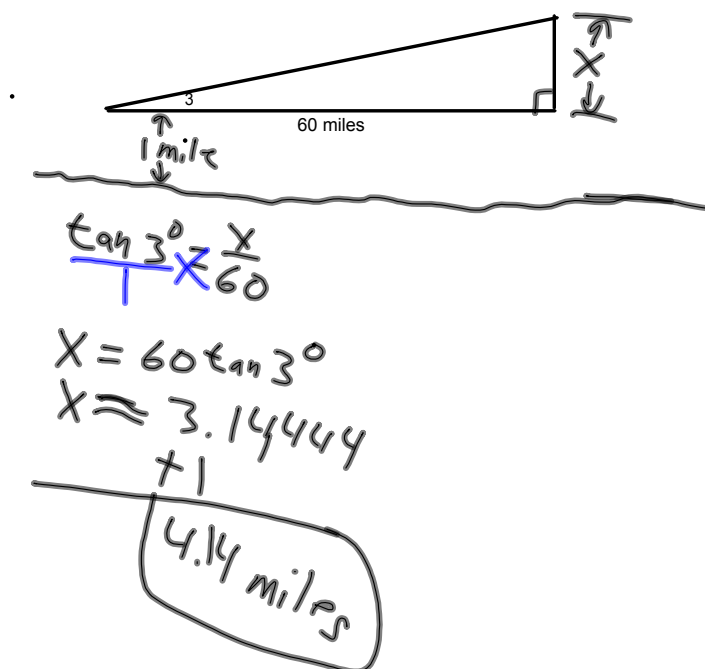
*The angle between the line of sight and the horizontal when looking up.

Angle of Depression:

*The angle between the line of sight and the horizontal when looking down

**Example 1**

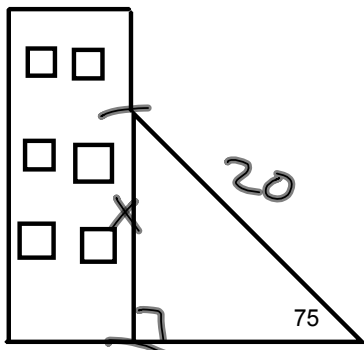
A plane is one mile above sea level when it begins to climb at a constant angle of 3° for the next 60 ground miles. About how far above sea level is the plane after its climb?



Example 2

To guard against a fall, a ladder should make an angle of 75° or less with the ground.

A.) What is the maximum height that a 20-foot ladder can reach safely?



$$\sin 75^\circ = \frac{X}{20}$$

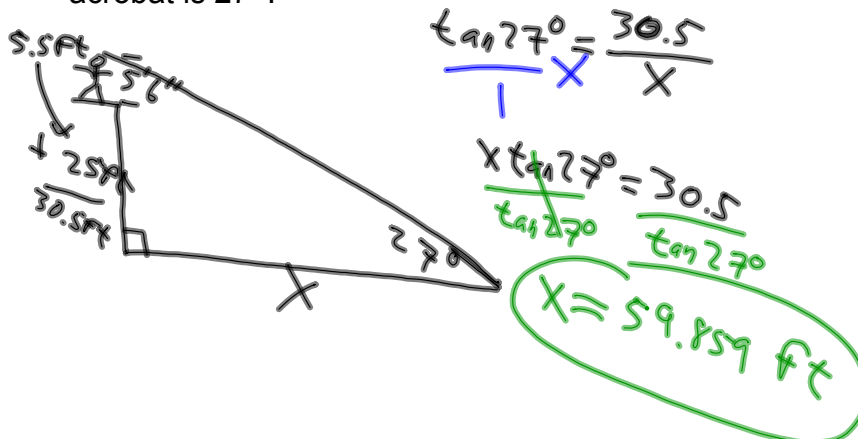
$$X = 20 \sin 75^\circ$$

$$X \approx 19.32 \text{ ft}$$

7-5 Angles of elevation and depression

Example 3:

At the circus, a person in the audience at ground level watches the high-wire routine. A 5-foot 6-inch tall acrobat is standing on the platform that is 25 feet off the ground. How far is the audience member from the base of the platform, if the angle of elevation from the audience member's line of sight to the top of the acrobat is 27° .



$$\tan 27^\circ = \frac{30.5}{X}$$

$$X \tan 27^\circ = 30.5$$

$$\frac{X \tan 27^\circ}{\tan 27^\circ} = \frac{30.5}{\tan 27^\circ}$$

$$X = 59.859 \text{ ft}$$

Example 4:

A wheelchair ramp is 3 meters long and inclines at 6° . Find the height of the ramp to the nearest tenth centimeter.

Example 5:

Vernon is on the deck of a cruise ship and observes two dolphins following each other directly away from the ship in a straight line. Vernon's position is 154 meters above sea level, and the angles of depression to the two dolphins are 35° and 36° . Find the distance between the two dolphins to the nearest meter.

