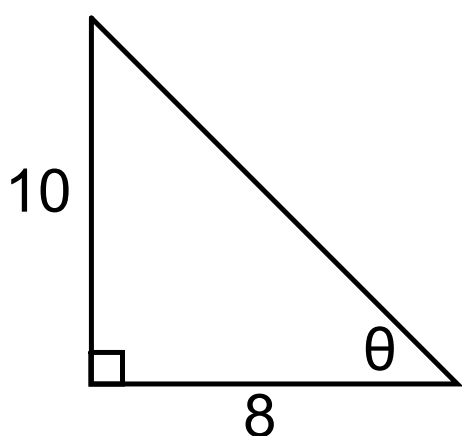


How do you find the measure of an angle?

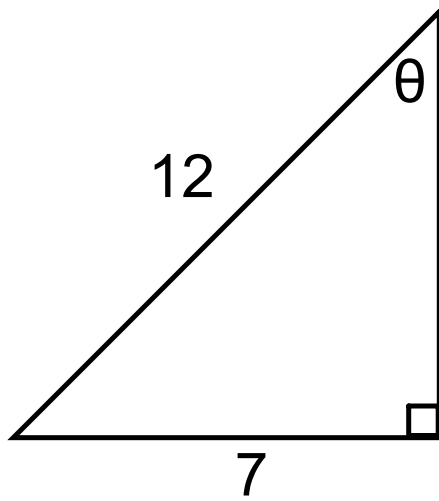


$$\tan \theta = \frac{10}{8}$$

$$\tan^{-1}\left(\frac{10}{8}\right) = \theta$$

$$\theta = 51.4^\circ$$

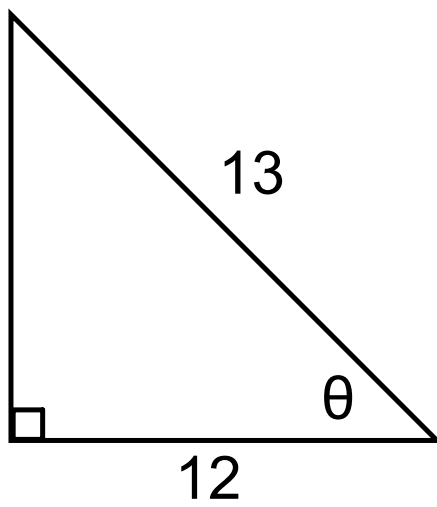
$$\theta = .89 \text{ radians}$$

Find θ 

$$\sin \theta = \frac{7}{12}$$

$$\sin^{-1}\left(\frac{7}{12}\right) = \theta$$

$$\theta = 35.7^\circ$$

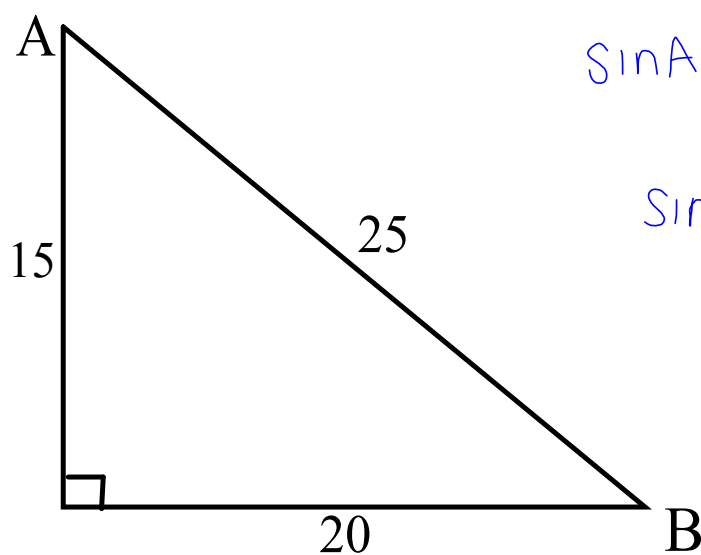


$$\cos \theta = \frac{12}{13}$$

$$\cos^{-1}\left(\frac{12}{13}\right) = \theta$$

$$\theta = 22.6^\circ$$

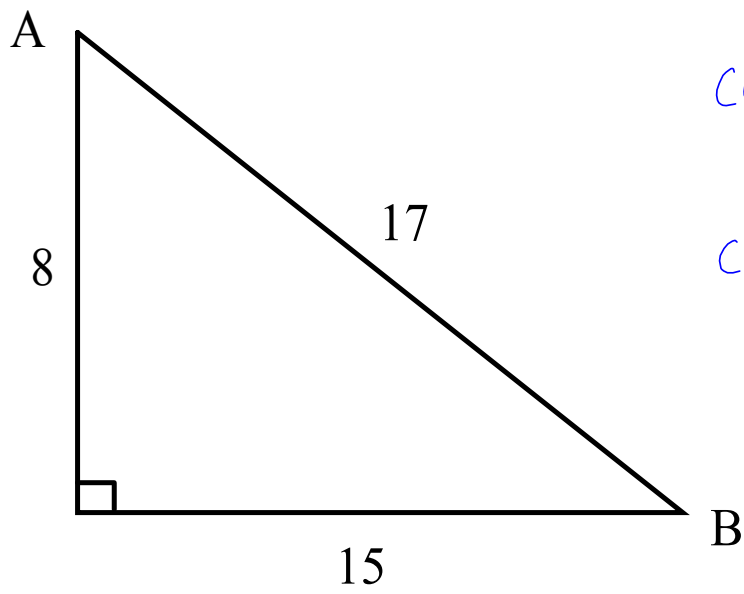
1. Find Sin A and Sin B



$$\sin A = \frac{20}{25} = \frac{4}{5} = .8$$

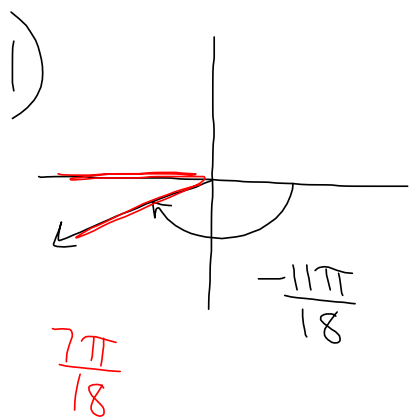
$$\sin B = \frac{15}{25} = \frac{3}{5} = .6$$

2. Find Cos A and Cos B



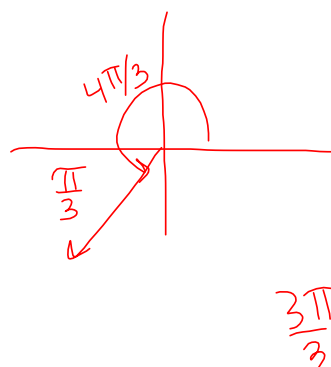
$$\cos A = \frac{8}{17}$$

$$\cos B = \frac{15}{17}$$

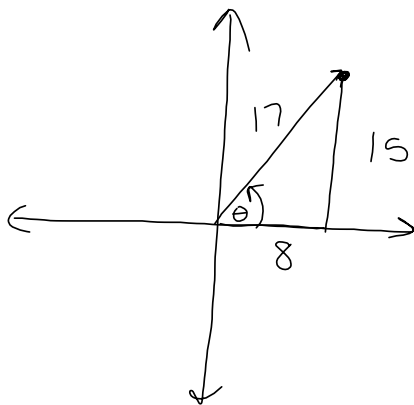


$$\frac{18\pi}{18}$$

$$\frac{36\pi}{18}$$



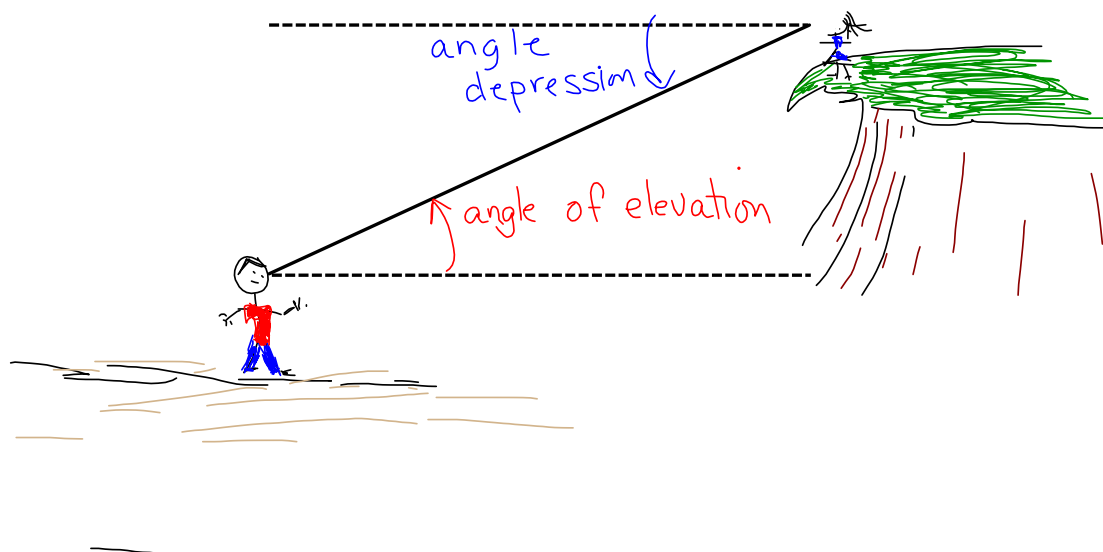
31)



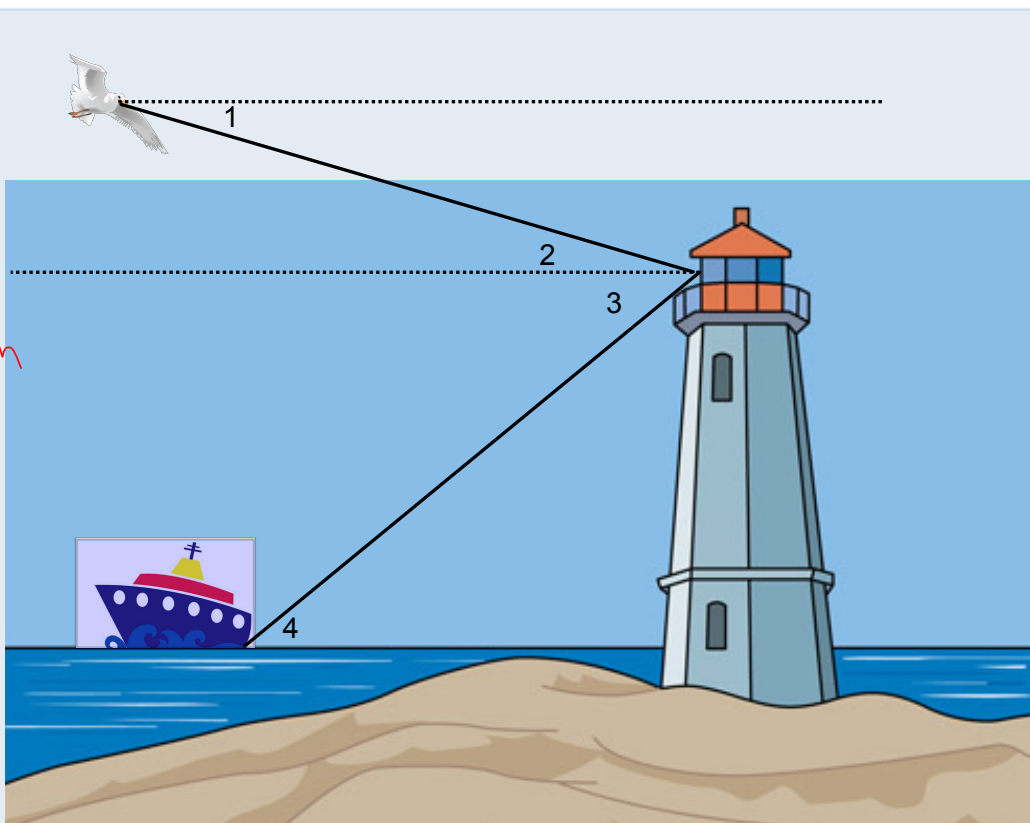
$$37) \quad \cos 22^\circ = .9272$$

Angle of Elevation: When you look up at an object, the angle that your line of sight makes with a line drawn horizontally.

Angle of Depression: When you look down at an object, the angle that your line of sight makes with a line drawn horizontally.



classify each angle as
an angle of elevation
or an angle of depression.



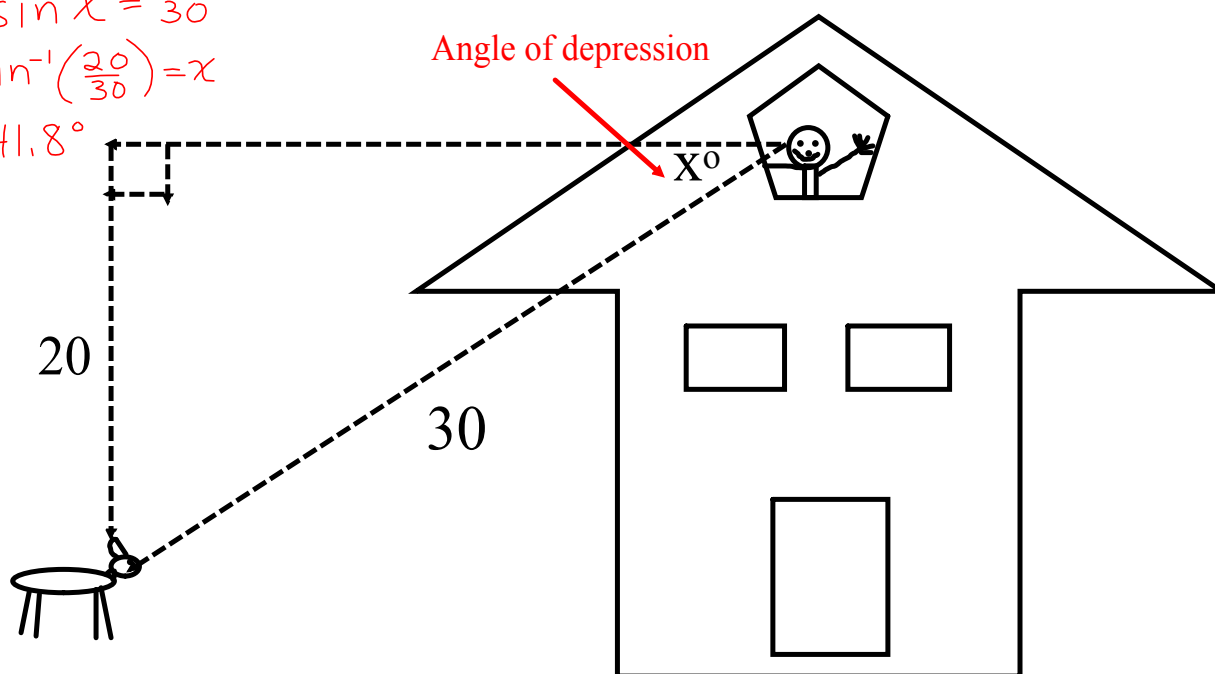
1. $\angle 1$ depression
2. $\angle 2$ elevation
3. $\angle 3$ depression
4. $\angle 4$ elevation

3. Solve for x.

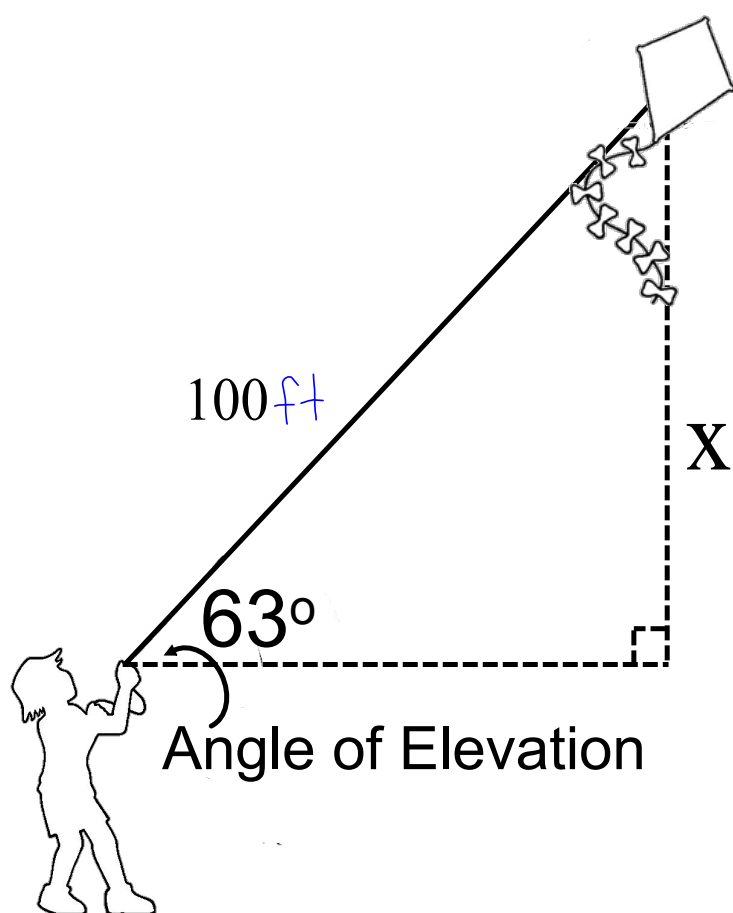
$$\sin x = \frac{20}{30}$$

$$\sin^{-1}\left(\frac{20}{30}\right) = x$$

$$x = 41.8^\circ$$



4.

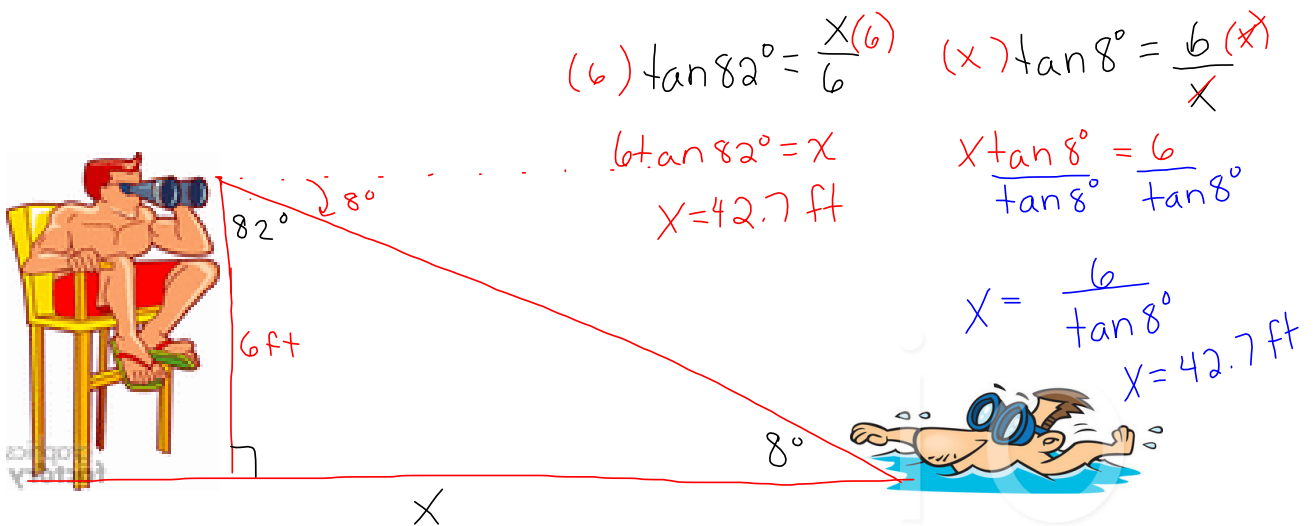


$$(100) \sin 63^\circ = \frac{x(100)}{100}$$

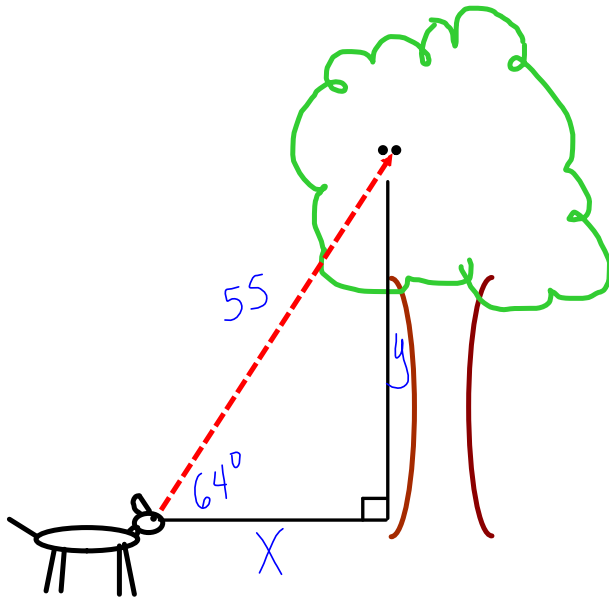
$$100 \sin 63^\circ = x$$

$$x = 89.1 \text{ ft}$$

5. A lifeguard is watching a beach from a line of sight 6 feet above the ground. He sees a swimmer at angle of depression of 8° . How far away from the tower is the swimmer?



6. A dog is looking at a squirrel at the top of a tree. The distance between the two animals is 55 feet and the angle of elevation is 64° . How high is the squirrel and how far is the dog from the base of the tree?



$$\cos 64^\circ = \frac{x}{55}$$

$$x = 55 \cos 64^\circ$$

$$x = 24.1 \text{ ft}$$

$$\sin 64^\circ = \frac{y}{55}$$

$$55 \sin 64^\circ = y$$

$$y = 49.4 \text{ ft}$$

7. A jet is flying at an altitude of 30,000 feet. An air traffic controller measures the angle of elevation to the plane to be 16.5° . Find the horizontal distance of the plane from the airport.



$$(x) \tan 16.5^\circ = \frac{30,000}{x} (x)$$

$$x \tan 16.5^\circ = 30,000$$

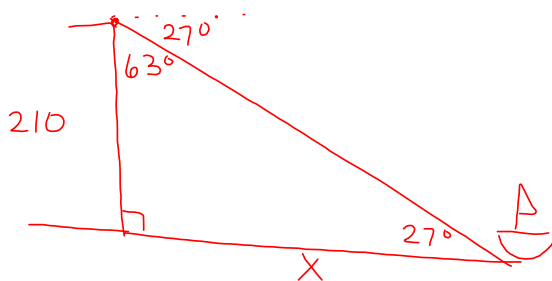
$$x = \frac{30000}{\tan 16.5^\circ}$$

$$x = 101,278.3 \text{ ft}$$

$$\approx 19.81 \text{ mi}$$

8. At a point on the ground 50 feet from the foot of a tree, the angle of elevation to the top of the tree is 53° . Find the height of the tree.

9. From the top a lighthouse 210 feet high, the angle of depression to a boat is 27° . Find the distance from the boat to the foot of the lighthouse. The lighthouse was built at sea level.



$$\tan 63^\circ = \frac{x}{210}$$

$$210 \tan 26^\circ = x$$

$$x \approx 412 \text{ ft}$$