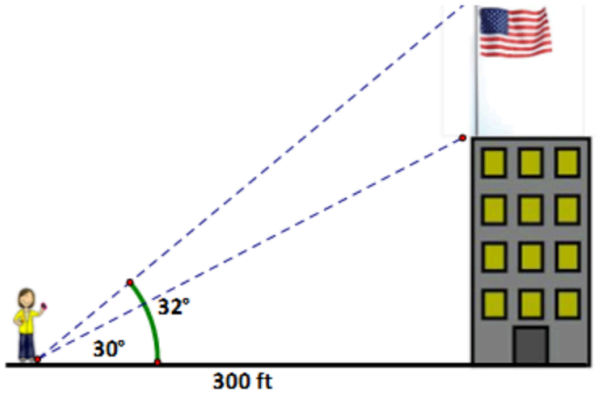
Trump Tower: Given the person is at 300m horizontally from the Trump Tower, retrieve the height of its flag pole, up to cm. Use GeoGebra freely for calculations (GeoGebra/View/CAS)

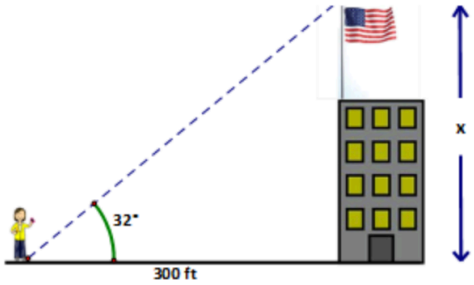
Solution

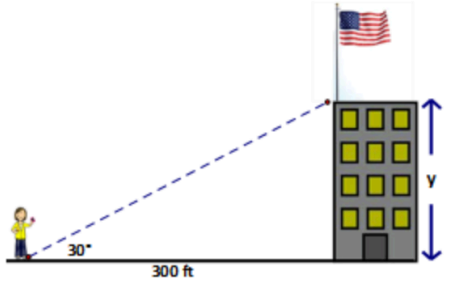
A flagpole is at the top of a building. 300 ft from the base of the building, the angle of elevation of the top of the pole is 32° and the angle of elevation of the bottom of the pole is 30°. Determine the length of the flagpole (to the nearest foot).

This problem looks quite complex because of the overlapping angles of elevation but really if we think through the problem we can simplify it by solving two different triangles.



The way to get the height of just the flagpole would be to calculate the total height from ground to top of flag (x) and then calculate the distance from ground to the bottom of the flagpole and then subtract the two values.





x – y will give us the flagpole height,

187.46 – 173.21 = 14.25 ft

$$\tan 32° = \frac{x}{300}$$

$$x = (\tan 32°)(300)$$

$$\tan 30° = \frac{y}{300}$$

$$y = (\tan 30°)(300)$$