

DO NOW

You are a block away from a skyscraper that is 780 feet tall. Your friend is between the skyscraper and yourself. The angle of elevation from your position to the top of the skyscraper is 42° . The angle of elevation from your friend's position to the top of the skyscraper is 71° . To the nearest foot, how far are you from your friend?

Handwritten solution for the skyscraper problem:

$$\tan 71 = \frac{780}{x}$$

$$x(\tan 71) = 780$$

$$\frac{x(\tan 71)}{\tan 71} = \frac{780}{\tan 71}$$

$$x = 268.575\dots$$

$$\tan 42 = \frac{780}{y}$$

$$y = \frac{780}{\tan 42}$$

$$y = 866.277\dots$$

$$y - x = 597.702\dots$$

598 ft

Apr 19-12:54 PM

As shown below, a canoe is approaching a lighthouse on the coastline of a lake. The front of the canoe is 1.5 feet above the water and an observer in the lighthouse is 112 feet above the water.

(Not drawn to scale)

At 5:00, the observer in the lighthouse measured the angle of depression to the front of the canoe to be 6° . Five minutes later, the observer measured and saw the angle of depression to the front of the canoe had increased by 49° . Determine and state, to the nearest foot per minute, the average speed at which the canoe traveled toward the lighthouse.

$$\tan 6 = \frac{110.5}{x}$$

$$x(\tan 6) = 110.5$$

$$\frac{x(\tan 6)}{\tan 6} = \frac{110.5}{\tan 6}$$

$$x = 1,051.337\dots$$

$$\tan 55 = \frac{110.5}{y}$$

$$y(\tan 55) = 110.5$$

$$\frac{y(\tan 55)}{\tan 55} = \frac{110.5}{\tan 55}$$

$$y = 77.372\dots$$

$$x - y = \frac{973.964\dots \text{ ft}}{5 \text{ min}}$$

$$194.79\dots$$

195 ft/min

Jan 30-2:08 PM