

6. **[12 points]** You are standing on flat ground some distance away from a skyscraper. Climbing up the skyscraper, 150 feet from the top, is a gorilla.

From where you stand, you measure the angle of elevation from the ground to the gorilla, and you find it to be  $70^\circ$ .

Then you measure the angle of elevation from the ground to the top of the skyscraper. It's  $75^\circ$ .

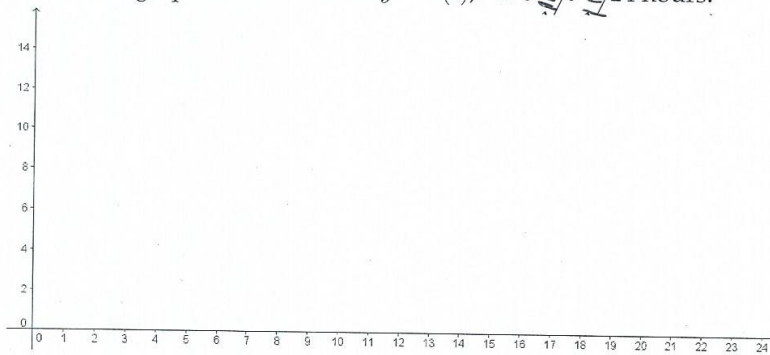
How tall is the skyscraper?

8. [12 points] The predicted times and heights of the high and low tides for the seaside village of Portwenn during a certain day are:

Time of day	Low/High Tide Height (in meters)
00:30	4.8
06:30	14.4
12:30	4.8
18:30	14.4

- (a) Find a sinusoidal function in standard form,  $h(t) = A \sin\left(\frac{2\pi}{B}(t - C)\right) + D$ , which models the tide height data for Portwenn at  $t$  hours past midnight, on the given day.

- (b) Sketch the graph of the function  $y = h(t)$ , for  $0 \leq t \leq 24$  hours.



- (c) A boat requires a tide height of 10 meters or more to be able to enter a harbor. Compute all the time intervals during this day when the boat could enter the Portwenn harbor.