

## Finding a Sinusoidal Model --- Big Ben

Big Ben is a huge clock located at the north end of the Palace of Westminster in London, England. The center of the clock is 55 meters above ground level. The minute hand of Big Ben is 3.5 meters in length.

We want to find a mathematical model giving the distance of the tip of the hand from the ground as a function of time.

Let  $H$  be the height (in meters) and  $t$  be the time (in minutes) with  $t = 0$  corresponding to the point in time when the minute hand is pointing at 12.

a) Identify the following:

The midline of the model:            The period of the model:            The amplitude of the model:

b) Write the equation  $H = f(t) =$  \_\_\_\_\_

c) Sketch the graph of the equation for two full periods starting at  $t = 0$ . Label the axes and the key points appropriately.

