**10.** (4 points each) At a nearby elementary school the seats of the swing set sit 2 feet off the ground when at rest. While observing a child swing, you note that the seat reaches a maximum height of 5 feet from the ground when the child swings without the aid of pushing from an adult. It takes the child 4 seconds to travel between successive maximum heights. (One is achieved while swinging forward, one while swinging backwards.)

(a) Sketch a graph of the seat's height above the ground (in feet) as a function of time (in seconds) on the axes provided below. Assume that at $t = 0$ the child is at her maximum height, and that she reaches the same maximum height each swing through. Be sure to label the axes carefully!
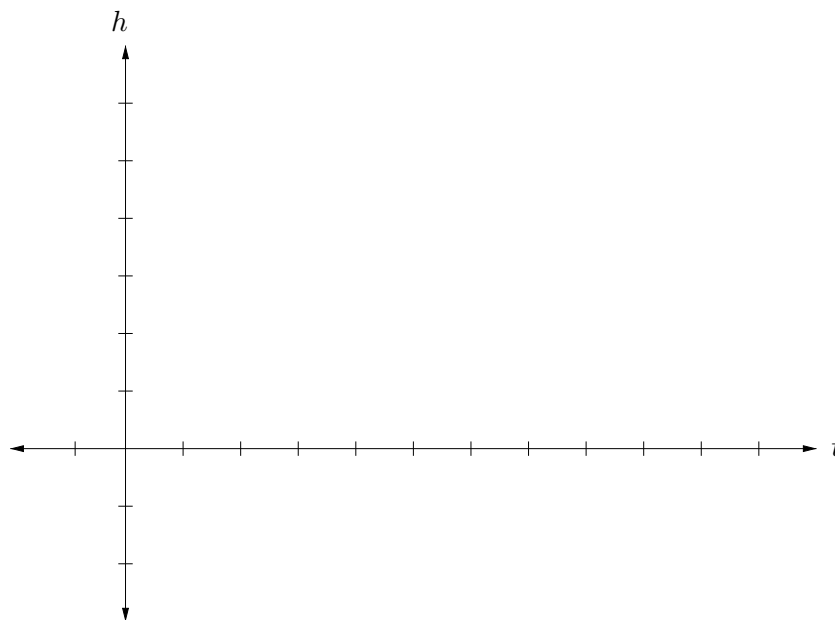
(b) Write a trigonometric equation describing the height of the seat as the child swings back and forth.

(c) At which time(s) during the first 4 seconds of motion is the height of the seat changing most rapidly?