

*A.M.D.E.*

1) A person riding a ferris wheel realizes that her height is varying sinusoidally with time. She reaches the top of the ride 5 seconds after she starts timing, and the height is 54 feet off of the ground. 12 seconds later, she is at the lowest point, 4 feet above the ground.

- a) Sketch at least one cycle of the graph that represents this situation.
- b) Find an equation that represents this situation
- c) How high off the ground is she at 22 seconds?
- d) What are the first four times that she is 12 feet off of the ground?

2) A person playing with a yo-yo recognizes that the motion is sinusoidal in nature. When he starts timing, the yo-yo is at its highest point, 45 cm above the floor. In 0.14 seconds, it is at its lowest point, 5 cm above the ground.

- a) Sketch at least one cycle of the graph that represents this situation.
- b) Find the equation that represents this situation.
- c) How high is the yo-yo at 12.2 seconds?
- d) What are the first 3 times that the yo-yo is 12 cm above the floor?

3) As you are driving through some foothills, you notice that the height of your car is varying sinusoidally with time. When you start timing, you are at the top of a hill that is 42 feet high. 1.4 seconds later, you are at the bottom of the hill at a height of 0 feet. In an equal amount of time, you are at the top of the next hill, which is also 42 feet high.

- a) Sketch at least one cycle of the graph that represents this situation.
- b) Find the equation that represents this situation.
- c) How high are you at 2.6 seconds?
- d) What are the first 3 times that you are at a height of 18 feet?

4) As you are playing the Super Mario 64™ video game, you notice that the snufit's height varies sinusoidally with the global timer. When the timer is at 2 seconds, the snufit's height is 26 inches above the surface. 1.5 seconds later, the snufit reaches its low point, 2 inches above the surface. It continues this pattern indefinitely.

- a) Sketch at least one cycle of the graph that represents this situation.
- b) Find the equation that represents this situation.
- c) What is the snufit's height when the time is 3.4 seconds?
- d) What are the first 3 positive times that the snufit has a height of 19 inches?

