A Trip Down Memory Lane
Remember graphical kinematics? Of course you do; who could forget the joys of graphing x vs. t, v vs. t, and a vs. t?

On the other side of this sheet is a set of axes (the old favorites: x, v, and a vs. t). The position graph has been produced by a mass in simple harmonic motion.

Your task is to determine the other two graphs based on characteristics of the position graph.

WARNING: Unlike our previous experiences in graphical kinematics, the plots on the other side will involve curved lines (changing slopes) on all three graphs.

Hint: All graphs will resemble a sine curve (they will oscillate sinusoidally, but not necessarily in phase with each other).

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Post Graphing Analysis
List the position or positions—using the letters A-E from the diagram—at which

1. the magnitude of displacement is at a maximum.

2. the magnitude of velocity is maximum.

3. the magnitude of acceleration is maximum.

4. the magnitude of displacement is at a minimum.

5. the magnitude of velocity is minimum.

6. the magnitude of acceleration is minimum.

The graph shown below depicts the position of an oscillating mass at various times during one cycle of motion. Based on this information, complete the concurrent graphs of velocity *vs*. time and acceleration *vs*. time.

A　　　　**B**　　　　**C**　　　　**D**　　　　**E**

Initially, the mass is moving upward.

v

a

　　　　8/16/07　db