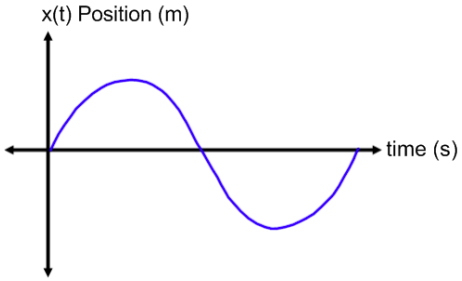
Derivatives and Physics

1. A particle moves along the x-axis such that its position is given in the graph below. Circle the graph where the particle is farthest to the right. Explain your reasoning.



2. Using the same position graph in #1, sketch the particles velocity graph on the same coordinate plane.

3. A particle move along the x-axis with position at time t given by $x(t) = e^t \cos t$ for $0 \leq t \leq 2\pi$. Find the time at which the particle is farthest to the right. Justify your answer.

4. A particle is moving along the x-axis so that its velocity at any time t, $0 \leq t \leq 6$, is given by $v(t) = e^{\sin t} - 2$. Find the acceleration of the particle at time $t = 2$. Is the speed of the particle increasing or decreasing at $t = 2$? Why or why not?