4.3 Parametric Functions and Rates of Change

AP Precalculus Name: _____ **CA #2**

A particles motion in the xy-plane is modeled by the parametric function $x(t) = t - 1$ and $y(t) = -(t+2)^2 + 3$. Use this function to answer the problems below.

1. Determine the direction of the particle's motion on the interval $0 \leq t \leq 3$.

2. Compute the average rate of change of $x(t)$ over the interval $0 \leq t \leq 3$.

3. Compute the average rate of change of $y(t)$ over the interval $0 \leq t \leq 3$.

4. Calculate the slope of the line between the points that correspond to $t = 0$ and $t = 3$.

5. Without the use of technology, determine which set of parametric equations will produce the same path as $f(t) = \left(\frac{3}{4}t^2 + 2t + 1, t + 1\right)$, but will have a direction of particle motion in the opposite direction?

(A) $x(t) = -\frac{3}{4}t^2 + 2t + 1,\ y(t) = -t + 1$

(B) $x(t) = \frac{3}{4}t^2 - 2t + 1,\ y(t) = -t + 1$

(C) $x(t) = \frac{3}{4}t^2 - 2t + 1,\ y(t) = -t - 1$

(D) $x(t) = t + 1,\ y(t) = \frac{3}{4}t^2 + 2t + 1$

Answers to 4.3 CA #2

1. x-values are increasing, y-values are decreasing. The direction is right and down.	2. Avg rate of change of $x(t)$ is 1.	3. Avg rate of change of $y(t)$ is -7.
4. Slope $= -7$	5. B	