

4.2 Parametric Functions Modeling Planar Motion

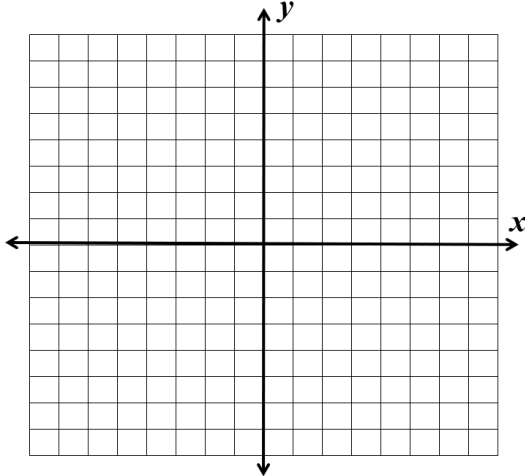
AP Precalculus

Name: _____

CA #1

1. An object is moving in the plane so that at any time t , the position of the object at any time t can be found by evaluating the parametric equations $x(t) = t^2$ and $y(t) = 2t + 1$.

- a. Without the use of technology, graph the path of the object for $-2 \leq t \leq 3$.



- b. If there were no restrictions on the parameter, what would the position of the object be when $t = 4$?

2. Without the use of technology, determine the horizontal and vertical extrema of the parametric function $f(t) = (t + 1, \sqrt{t})$ for $0 \leq t \leq 9$.

- a. Find the horizontal relative extrema.

- b. Find the vertical relative extrema.

For each parametric function, find the x - and y -intercepts algebraically.

3. $f(t) = (t - 1, t^2 - 8t + 12)$.

- a. x -intercept(s).

- b. y -intercept(s).

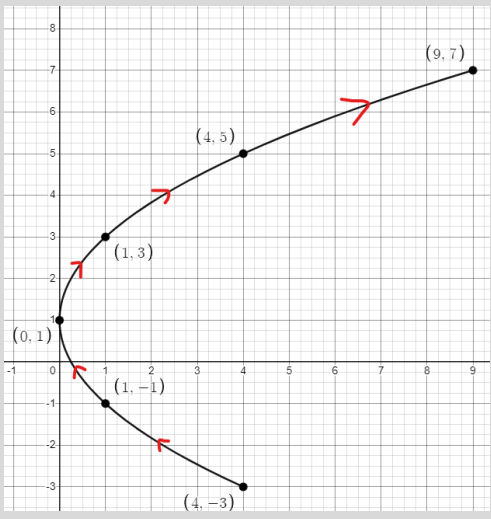
4. $x(t) = t + 2$ and $y(t) = t^2 - 4$ for $0 \leq t \leq 5$.

- a. x -intercept(s).

- b. y -intercept(s).

5. Without the use of technology, determine the maximum height of an object if the path is modeled by the parametric function $f(t) = (t - 1, t^3)$, for $0 \leq t \leq 5$

Answers to 4.2 CA #1

<p>1a.</p> 	<p>1b. (16,9)</p>	<p>2. a. Horizontal Relative Minimum is 1 when $t = 0$ Horizontal Relative Maximum is 10 when $t = 9$ b. Vertical Relative Minimum is 0 when $t = 0$ Vertical Relative Maximum is 3 when $t = 9$</p>
<p>3a. (5,0) when $t = 6$ and (1,0) when $t = 2$. 3b. (0,5) when $t = 1$.</p>	<p>4a. (4,0) when $t = 2$ (only one in the given domain for t). 4b. none on the given domain of t.</p>	
<p>5. Vertical Relative Maximum is 125 when $t = 5$.</p>		