Entry #: _____

Lesson 9.1: Parametric Equations

Examples:

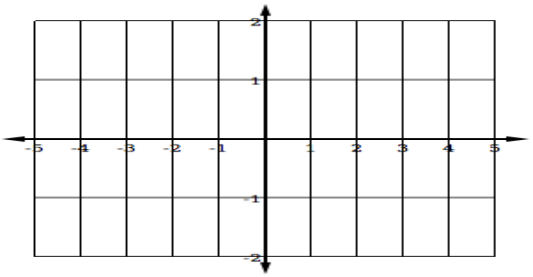
1. Plot points to sketch the curve described by the parametric equations. Mark the orientation on the curve.

$x = t^2 - 5$

$y = \frac{t}{2}$

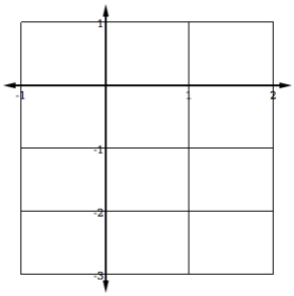
$-3 \leq t \leq 2$

t						
x						
y						

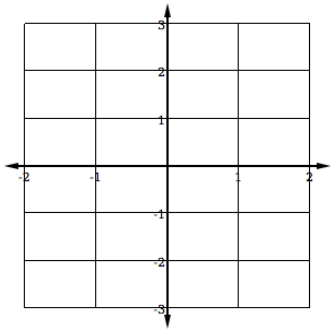


2. Change the following to rectangular form by eliminating the parameter. Then graph.

$x = \frac{1}{\sqrt{t+1}}$ and $y = \frac{t}{t+1}$, $t > -1$.



3. Eliminate the parameter to sketch the curve. $x = \cos(\theta)$ and $y = 3\sin(\theta)$, $0 \leq \theta \leq 2\pi$



1. If $x = \cos(t)$ and $y = 3\sin(t)$ find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$.

2. Find the slope and concavity of $x = \sqrt{t}$ and $y = \frac{1}{4}t^2 - 1$, $t \geq 0$ at the point $(2,3)$.

3. Write an equation of a tangent line to the curve defined by $x = t - 1$ and $y = \frac{1}{t} + 1$ at the point when $t = 1$.

Arc Length

Example: Using the parametric equations from example 3 above, find the arc length on the interval $1 \leq t \leq 3$.