Calculus Homework Assignment 4

Class: _____

Student Number: _____

Name: _____

1. Use the given parametric equations and parameter intervals for the motion of a particle in the xy-plane. Identify the particle's path by finding a Cartesian equation for it. Graph the Cartesian equation. (The graphs will vary with the equation used.) Indicate the portion of the graph traced by the particle and the direction of motion.

$$x = 3t, \ y = 9t^2, \ -\infty < t < \infty.$$

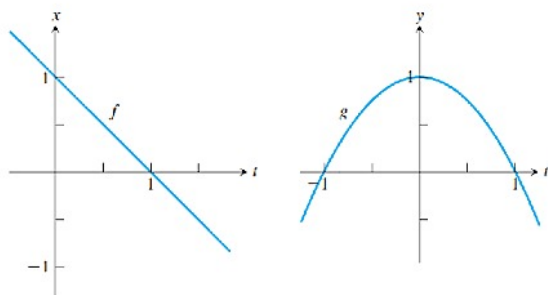$[\S 10.1 - 1]$

2. Finding Cartesian from Parametric Equations and graph it.

$$x = \sin t, \ y = \cos 2t, \ -\frac{\pi}{2} \le t \le \frac{\pi}{2}.$$

$[\S 10.1 - 9]$

3. Use the given graphs of $x = f(t)$ and $y = g(t)$ to sketch the corresponding parametric curve in the xy-plane.

$[\S 10.1 - 25]$

4. Find the area under one arch of the cycloid

$$x = a(t - \sin t), \ y = a(1 - \cos t).$$

$[\S 10.2 - 21]$

(Over Please)

5. Find the lengths of the curves

$$\begin{cases} x = 8\cos t + 8t\sin t \\ y = 8\sin t - 8t\cos t \end{cases}, 0 \leq t \leq \frac{\pi}{2}.$$

[§10.2 − 29]

6. Graph the sets of points whose polar coordinates satisfy the inequality.

$$\frac{\pi}{4} \leq \theta \leq \frac{3\pi}{4}, \quad 0 \leq r \leq 1.$$

[§10.3 − 23]

7. Replace the polar equation $r^2 = 1$ with equivalent Cartesian equations. Then describe or identify the graph.

[§10.3 − 35]

8. Replace the Cartesian equations with equivalent polar equations.

$$x^2 + y^2 = 4.$$

[§10.3 − 57]

(The end)