Math 151 Name: _____

QUIZ ON CHAPTER 13

MATH 151 – SPRING 2003 – KUNIYUKI
100 POINTS TOTAL

Show all work, simplify as appropriate, and use "good form and procedure" (as in class).
Box in your final answers!
No notes or books allowed. A scientific calculator is allowed.

When graphing, be reasonably accurate, and clearly indicate orientation.
Use as many arrowheads as appropriate. Clearly indicate *x*- and *y*-intercepts, endpoints, and extreme points when feasible.

1) Find a rectangular equation for the curve described by:

$$x = t^2 + 3$$
$$y = 4 - t$$
$$t \text{ in } \mathbf{R}$$

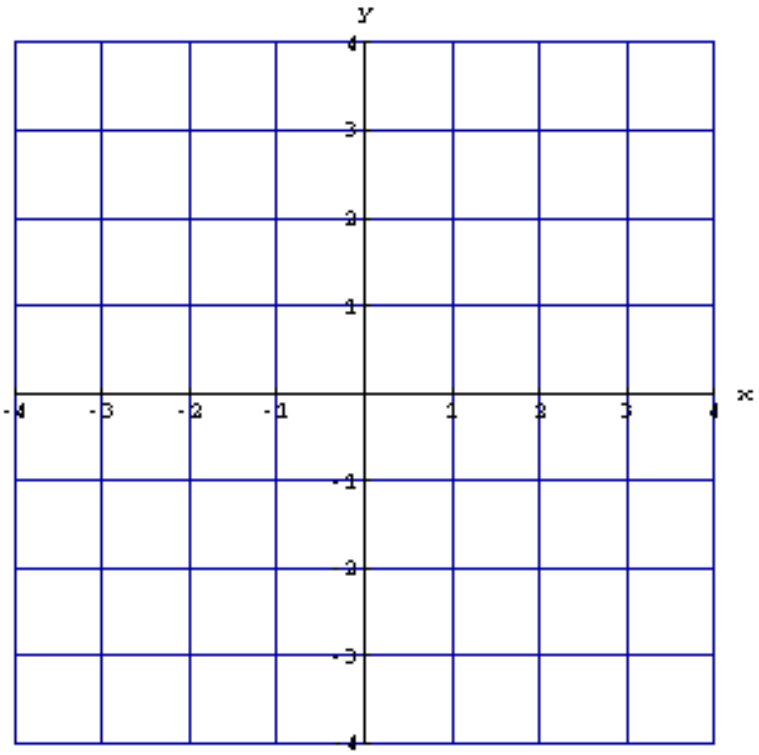
(4 points)

2) Find a rectangular equation in *x* and *y* that has the same graph as the polar equation $r^2 = 6 \sec\theta \csc\theta$. (6 points)

3) Sketch the graph of C using the grid below, where C is described by:

$$x = \cos t$$
$$y = \sec^2 t$$
$$\frac{\pi}{2} < t < \pi$$

(10 points)



4) Consider the curve described by:

$$x = e^{2t}$$
$$y = \sqrt{t}$$
$$t \geq 0$$

(16 points total)

a) Find the slope of the tangent line at the point on the curve that corresponds to $t = 4$. Give an exact answer; don't approximate. (10 points)

b) Set up, **but do not evaluate**, an integral that represents the length of the curve from the point corresponding to $t = 1$ to the point corresponding to $t = 4$. (6 points)

5) Consider the curve described by:

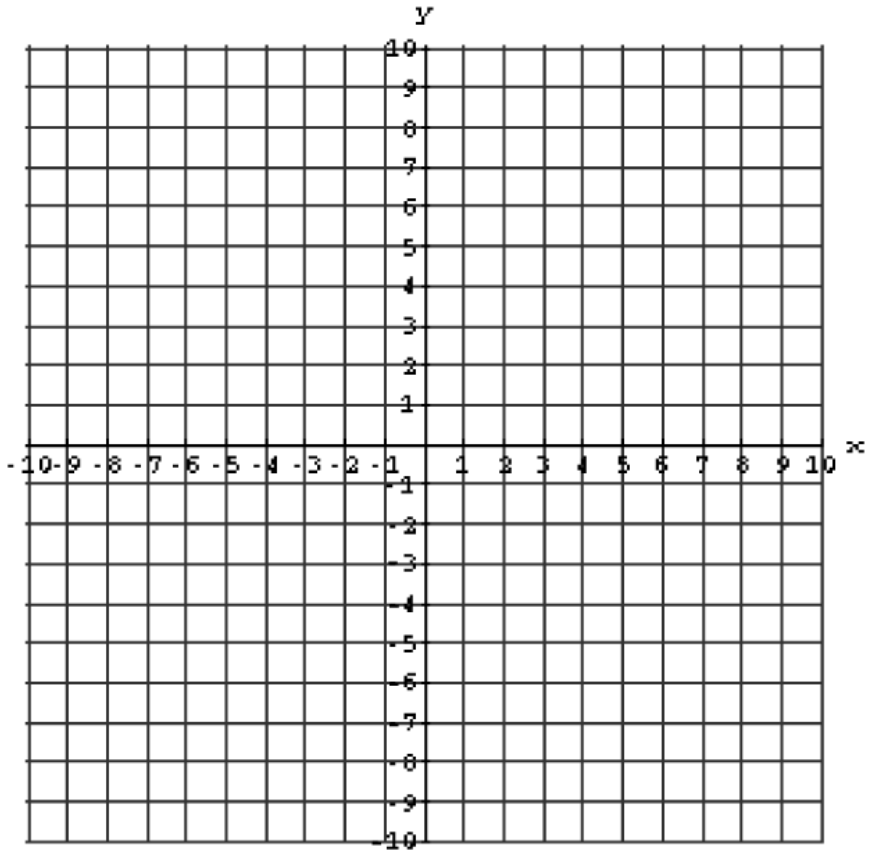
$$x = t^3 + 1$$
$$y = \sin t$$
$$t \text{ in } \mathbf{R}$$

Find $\frac{d^2y}{dx^2}$ in terms of t. (10 points)

6) Find the slope of the tangent line to the graph of the polar equation $r = 2 - 3\sin\theta$ at the point corresponding to $\theta = \frac{\pi}{6}$. Give an exact answer, but you do <u>not</u> have to rationalize the denominator. (18 points)

YOU MAY CONTINUE ON THE NEXT PAGE.

7) Sketch the graph of $r = 3 + 4\cos\theta$ using the grid below. You do not have to determine the exact value(s) of θ for which $r = 0$. (20 points)



8) Find the area of the region bounded by one loop of the graph of the polar equation $r = 3\sin(2\theta)$. You may use the grid below as a guide. (16 points)