Name:

- 10.1: 11,38,47,65
- 10.2: 38,39,68
- 10.3: 7,21,24,35
- 10.4: 3,9,12
- 10.1: 11,38,47,65

11. Sketch the curve and indicate the increasing direction of t for

$$x = 2\sin^2(t) \qquad \qquad y = 3\cos^2(t)$$

38. Find the parametric equtions for the rectangle, starting at the point  $(\frac{1}{2}, \frac{1}{2})$  then traveling counter clockwise through the remaining points  $(-\frac{1}{2}, \frac{1}{2})$ ,  $(-\frac{1}{2}, -\frac{1}{2})$ ,  $(\frac{1}{2}, -\frac{1}{2})$ an then back to  $(\frac{1}{2}, \frac{1}{2})$ . Hint you should make each edge a separate parametric equation. So equation 1 should be the kline from  $(\frac{1}{2}, \frac{1}{2})$  to  $(-\frac{1}{2}, \frac{1}{2})$ .

47. Find  $\frac{dy}{dx}$  and  $\frac{d^2y}{dx^2}$  for

 $x = \sec(t)$   $y = \tan(t)$ 

65. Find the arc length for the function over the interval  $x = t^2$  and  $y = \frac{1}{3}t^3$  where  $0 \le t \le 1$ .

- 38. Graph:  $r^2 = \cos(2\theta)$
- 39. Graph:  $r^2 = 16\cos(2\theta)$
- 68. Show if A and B are not both zero then

$$r = A\cos(\theta) + B\sin(\theta)$$

is a circle. Find its radius.

## 10.3: 7,21,24,35

7. Find  $\frac{dy}{dx}$  for  $r = 2 + 2\sin(\theta)$ .

21. Calculate the arc length for the entire cardiod:  $r = a(1 - \cos(\theta))$ 

24. Sketch the spiral  $r = e^{-\theta/8}$  where  $0 \le \theta \le \infty$ . Then calculate its entire arclength.

35. Find the area of the region in the first quadrant betweeen the two graphs  $r = \sqrt{\cos(2\theta)}$  and  $r = 2\cos(\theta)$ .

## 10.4: 3,9,12

3. Graph the two parabolas

(a) 
$$y^2 = 4x$$

(b) 
$$x^2 = -8y$$

9. Graph the two elipses

- (a)  $(x+3)^2 + 4(y-5)^2 = 16$
- (b)  $\frac{1}{4}x^2 + \frac{1}{9}(y+2)^2 1 = 0$

12. Graph the two hyperbolas

(a) 
$$\frac{x^2}{16} - \frac{y^2}{9} = 1$$

(b) 
$$9y^2 - x^2 = 36$$