

**Math 231 Section A1**  
**Quiz 11**  
**July 26, 2007**

Name: \_\_\_\_\_

1) (6 points) (a) Find polar equations for the ellipse  $x^2/4 + y^2/9 = 1$ .

(b) Find a rectangular equation for the polar equation

$$r^2 = \frac{\cos(\theta) + \sin(\theta)}{\cos(\theta) - \sin(\theta)}.$$

2) (6 points) Find the slope of the tangent line of the three-leafed rose  $r = \cos(3\theta)$  at  $\theta = \pi/4$ .

3) (8 points) Let  $C$  be the curve  $r = \sin(2\theta)$ .

a) Sketch  $C$ .

b) Find the area enclosed by  $C$ .

Extra Credit) Determine if the curve from Question 2 at  $\theta = \pi/4$  is concave up or concave down.