

Math 181  
Fall, 2009

Name \_\_\_\_\_

Homework #15

Due Wednesday, October 28

No late homework accepted! No excuses!

1. Find the area enclosed by one loop of the four-leaved rose  $r = \cos(2\theta)$ .

2. Find the area of the region that lies inside the circle  $r = 3 \sin \theta$  and outside the cardioid  $r = 1 + \sin \theta$ .

3. Find the area of the region that lies inside both curves.

$$r = \sin(2\theta)$$

$$r = \cos(2\theta)$$

4. Find the area inside the larger loop and outside the smaller loop of the limaçon

$$r = \frac{1}{2} + \cos \theta .$$