

**MATH 311 – CALCULUS 3**  
**Spring 2006**  
**QUIZ 9**

NAME \_\_\_\_\_

1. Consider a thin rectangular metallic plate  $R = [-2, 1] \times [-1, 2]$  with constant density  $\rho(x, y) = 4$ . Compute the moment of  $R$  about the  $y$ -axis.

2. Set up but DO NOT EVALUATE a double integral in polar coordinates that transforms the integral

$$\int_0^5 \int_{-\sqrt{25-x^2}}^{\sqrt{25-x^2}} x^2 + y^2 \, dy \, dx$$

3. Set up but DO NOT EVALUATE a double integral in polar coordinates giving the area bounded by the cardioid  $r = 2 - 2 \sin \theta$ .

4. Use a double integral to compute the area of the parallelogram  $P$  contained in the plane  $z = \frac{3}{2}x + \frac{1}{3}y$  and above the rectangle  $R = [0, 2] \times [0, 3]$ . No credit for answers without work.