

**EXAM 3**(Take Home)  
Math 232  
April 13, 2007

Name \_\_\_\_\_

1. For each of the following integrals, draw a careful graph of the region of integration  $R$ , decide whether or not to switch to polar coordinates (explain your decision) and calculate the integral.

(a) 
$$\int_0^{\ln 4} \int_{e^x}^4 \frac{y}{\ln y} dy dx$$

(b) 
$$\int_0^2 \int_x^{\sqrt{8-x^2}} (x^2 + y^2)^{\frac{3}{2}} dy dx$$

2. Write a double integral that describes the volume of the portion of the elliptical cylinder  $x^2 + 4y^2 = 4$  between the  $xy$ -plane and the plane  $x + 2y + 3z = 6$ .