

Math 250B X01  
Test Three

Time: 50 minutes  
Total: 24 marks

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

1. [4 marks] Set up a triple integral in rectangular coordinates for the volume under  $z = 12 - 4x - 2y$  in the first octant.

2. [4 marks] Set up a triple integral in cylindrical coordinates for the volume between the  $xy$ -plane and  $z = 81 - x^2 - y^2$ .

3. [4 marks] Set up a triple integral in spherical coordinates for the volume between  $z = \frac{\sqrt{x^2+y^2}}{3}$  and  $z = 1$ .

4. [6 marks] Find the surface area of the part of the surface  $z = 6 + xy$  that lies inside the cylinder  $x^2 + y^2 = 9$ . Note: You don't need to graph  $z = 6 + xy$  in order to solve the problem.

5. [6 marks] Find the work done by the force field  $\mathbf{F} = [y, x + y]$  along the straight line segment from  $(3, -2)$  to  $(6, 7)$ .