MATH 162   PRACTICE QUIZ 1C

1. Sketch the region in the first quadrant bounded by the x-axis, the y-axis, the line $x = \sqrt{3}$ and the curve $y = \sqrt{x^2 + 1}$.   This region is rotated about the y-axis.   Using the *shell method*, write a definite integral that expresses the volume of this solid of revolution. You *need not* evaluate this integral.

2. The base of a certain solid is the disk $x^2 + y^2 \le 25$ in the xy-plane.   Each cross-section of the solid cut out by a plane perpendicular to the x-axis is an isosceles right triangle with its hypotenuse on the base of the solid.   Express the volume of the solid as a definite integral. *Do not evaluate.*

3. Consider the region in the xy-plane bounded by the parabola $y = x^2$ and the line $y = 36$. Revolve the region about the line x = 11.   Using the *washer method* express the *volume* as a definite integral.   *Do not evaluate.*   Be certain to sketch the region.

Extra Credit: A solid is generated by revolving about the x-axis the region bounded by the graph of the positive continuous function y = f (x), the x-axis, and the fixed line x = a and the variable line x = b where b > a.

Its volume, for all *b*, is $b^2 - ab$.   Find the function f(x).