

MATH 162

PRACTICE QUIZ 2C

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 $x^2 + y^2 \leq 25$ 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 $f(x)$.