**MATH 162 Practice Quiz 2A**

*"I could have done it in a much more complicated way," said the red Queen, immensely proud.*

***1.*** Sketch the region bounded by y = 1, x = 0, and y = tan3x.

This region is rotated about the line y = 1. Express the volume as a definite integral. You *need not* evaluate this integral.

***2***. Sketch the region bounded by y = x and y = 4x – x2.

This region is rotated about the line x = 7. Express the volume as a definite integral. You *need not* evaluate this integral.

***3.*** The base of a solid *S* is a triangular region with vertices (0, 0), (3, 0), and (0, 2). Cross-sections perpendicular to the y-axis are semi-circles. Express the volume as a definite integral. You *need not* evaluate this integral.

***Extra Credit:*** Suppose that a hemispherical bowl of radius *r*, initially full of a liquid, is tilted by 45 degrees. How much liquid remains in the bowl? You may express your answer as one (or more) definite integrals. You need not evaluate.