

MATH 162

PRACTICE QUIZ 1A

"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 $y = \tan^3 x$.

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 $y = 4x - x^2$.

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.