

MATH141(0332/0342) Calculus II Fall 2009

Quiz 1, Section 6.1-6.8, September 17, 2009

Name: _____

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible.

Calculator is not allowed in this quiz. You have 20 minutes to take this 24 points quiz. Only 20 points will count to your final score.

1. (8 points) The base of the solid is an ellipse which has the equation

$$\frac{x^2}{4} + y^2 \leq 1.$$

The area of each cross section perpendicular to the x-axis is an equilateral triangle. Find the volume of the solid.

2. (8 points) A hemispherical tank with radius 10 feet is filled with water. Find the amount of work required to pump all but 2 feet of water in the tank to 5 feet above the top of the tank. (You are only asked to set up the integral. No need to evaluate it)

3. (8 points) Calculate the center of gravity of the region R between the graphs of f and g on the given interval.

$$f(x) = \frac{2}{\sqrt{x-1}}, g(x) = \frac{2}{\sqrt{x+1}}, [2, 5]$$