

MATH 162Q, Quest Calculus IIA

Workshop #2

Due Monday September 28, 2009

Group members are required to write up solutions individually. It is important that you write up solutions in your own words. You should explain not only what, but also why you decided to do what you did. You should think of this as an opportunity to reflect on the process that will lead you to a correct solution to similar problems.

Please use this as a cover sheet to your workshop writeup. Make sure all work is stapled and turn it into the professor before class on the due date.

NAME: _____

Please list all your group members, and on a scale from **1 (low)** - **5 (high)** rank your and their participation in the workshop. This will not affect grades, rather, it will supply the professor and TA with workshop feedback.

Group Member	Participation

Problem 1. Consider a sphere of radius r . Let V be the volume of the sphere. Using **definite integral**, prove that

$$V = \frac{4\pi}{3}r^3.$$

Problem 2. Sketch the region in the xy -plane defined by the inequalities

$$x - 2y^2 \geq 0, \quad 1 - x - |y| \geq 0,$$

and find its area.

Problem 3. Find the number a such that the vertical line $x = a$ bisects the area under the curve

$$y = \frac{1}{x^2}, \quad 1 \leq x \leq 4.$$

Problem 4. Find the number b such that the horizontal line $y = b$ bisects the area described in Problem 3.

Problem 5. Find the volume common to two spheres, each with radius r , if the center of each sphere lies on the surface of the other.