

Take Home Group Quiz, Week 15
Due December 7, 2006 in class
20 points total

Rules: You may work in a group with up to 6 members and turn in one joint answer sheet. (Everyone in the same group will receive the same grade.) Each group member must write up the solution to at least one part (1, 2, 3a, 3b, 4a, 4b). If there are three or fewer group members, each group member must write up at least two parts. Write the name of all group members on your answer sheet, and write the group member who authored the part's solution next to the part. As always, **show all work** for full credit! You must turn this assignment in on Thursday, December 7th in the **first 5 minutes** of class for full credit.

1. (4 pts) Find the arc length of the curve $x = y^3/12 + 1/y$ from $(\frac{7}{6}, 2)$ to $(\frac{31}{12}, 3)$.
2. (4 pts) Find the area enclosed between the curves $y^2 = -4x$ and $x^2 = y$.
3. (6 pts) The curves $y = \cos x$ and $y = 1 - \cos x$ intersect twice between $-\pi/2$ and $\pi/2$. Let R be the region enclosed by these curves between these points.
 - (a) Find the area of R .
 - (b) Rotate the region about the x -axis. Find the volume of the resulting solid.
4. (6 pts) Let R be the region bounded by the curves $y = \frac{1}{x}$, $y = 0$, $x = \frac{1}{2}$, and $x = 3$. If we rotate this region about the y -axis, find the volume of the resulting solid in two ways.
 - (a) Using the shell method.
 - (b) Using the disk/washer method. (*Hint: You'll need to break the solid into two pieces.*)