Math 21B **Midterm 2** **Fall 2010**

NAME(print in CAPITAL letters, first name first): _____

NAME(sign): _____

ID#: _____

Instructions: There are seven problems. Some questions are easier than others so you are encouraged to read the entire exam before beginning your work. Make sure that you have all 7 problems.

1	
2	
3	
4	
5	
6	
7	
TOTAL	

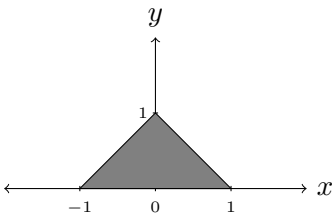
1. (20 points.) The region bounded by the graphs of $y = 2\sqrt{x}$, $y = 2$ and $x = 0$ is revolved about the x-axis. Find the volume of the resulting solid.

2. (20 points.) The region bounded by the graphs of $y = \sqrt{x}$ and $y = x^2/8$ is revolved about the y-axis. Find the volume of the resulting solid.

3. (20 points.) Find the area of the region bounded by the graphs of $y = 0$, $y = 2$, $y = \sqrt{x}$ and $y = \sqrt{x-1}$.

4. (20 points.) A car traveling at a constant speed of 10 miles per hour has a deteriorating engine. After t hours the gas mileage is $20/(t+1)$ miles per gallon. How far will the car go on 6 gallons of gas?

5. (20 points.) Find the mass of the triangular region below. All lengths are in meters, and the density of the region is given by $\delta(y) = y$ grams/m^2.



6. (20 points.) Find the area of the surface obtained by revolving the curve $y = x+1,\ 0 \leq x \leq 1$ about the y-axis.

7. (20 points.) A rope 50 meters long weighing 2 Newtons per meter is hanging over the edge of a tall building and does not touch the ground. How much work is required to lift the entire rope to the top of the building?