Math 1B: Quiz 4 Name: _____

GSI: Theo Johnson-Freyd Thursday, 9 July 2009

You must always justify your answers. This means: show your work, show it neatly, and when in doubt, use words (and pictures!) to explain your reasoning. No justification = no points.

1. (5 pts) Sketch the region $R = \{y \leq \cos x;\ y \geq 0;\ x \leq \pi/2\}$. Find the coordinates of the centroid of the region R, and mark it on your sketch.

2. (5 pts) Sketch the solid of revolution formed by rotating the region $R = \{y \leq \cos x;\ y \geq 0;\ x \leq \pi/2\}$ around the x-axis. Find the *total* surface area of the solid.

3. (bonus) Write an integral expression for the centroid of the *solid* of revolution in problem 2. Write an expression for the centroid of the *surface* formed by rotating the curve $\{y = \cos x : 0 \leq x \leq \pi/2\}$ around the x-axis.