Fall 2005 Math 152

Week in Review 7
courtesy: Amy Austin
(covering sections 9.3-9.5)

Section 9.3

1. Find the length of the curve $y = \frac{1}{3}x^{\frac{3}{2}}$, $0 \le x \le \frac{1}{4}$.

2. Find the length of the curve $x = \ln(\cos y)$, $0 \le y \le \frac{\pi}{4}$.

3. Find the length of the parametric curve $x = 3t - t^3$, $y = 3t^2$, $0 \le t \le 2$.

Section 9.4

4. Find the surface area obtained by revolving the given curve about the indicated axis.

   a.) $y = x^3$, $0 \le x \le 2$ about the x axis.

   b.) $y^2 = x + 1$, $1 \le y \le 4$ about the x axis.

   c.) $y = x^2 + 4$, $0 \le x \le 1$, about the y axis.

   d.) $y = \sqrt{x}$, $x = 1$, $x = 4$, about the x axis.

   e.) $x = e^{2y}$, $0 \le y \le 1/2$, about the y axis. Set up a dx integral and a dy integral. Do not evaluate either integral.

   f.) $x = \cos(2t)$, $y = \sin(2t)$, $0 \le t \le \frac{\pi}{4}$ about the y axis. Do the same about the x axis.

Section 9.5

5. Find the center of mass of the system consisting of the masses 2 g, 15 g, 4 g, and 1 g located at the points $x = -4$, $x = 1$, $x = 5$, and $x = 10$ along the x axis, respectively.

6. Find the centroid of the system consisting of the masses 1 g, 3 g and 7 g located at the points $(-2, 3)$, $(5, 1)$ and $(6, -3)$, respectively.

7. Find the centriod (x-coordinate only) of the region bounded by $y = e^{2x}$, $x = 0$, $x = 1$ and $y = 0$.

8. Find the centriod (x- coordinate only) of the quarter circle $x^2 + y^2 = 9$, $0 \le x \le 3$.

9. Find the centroid (x- coordinate only) of the region bounded by $y = x^2$ and $y = 2x$.