

# Spring 2009 Math 152

## Week in Review 6

*courtesy: Amy Austin*

(covering sections 9.3-9.5)

### Section 9.3

1. Find the length of the curve  $y = 2x^{3/2}$ ,  $0 \leq x \leq \frac{1}{4}$ .
2. Find the length of the curve  $x = \ln(\cos y)$ ,  
 $0 \leq y \leq \frac{\pi}{4}$ .
3. Find the length of the parametric curve  $x = 3t - t^3$ ,  
 $y = 3t^2$ ,  $0 \leq t \leq 2$ .
4. Find the length of the curve  $y = x^2 - \frac{\ln(x)}{8}$  from  
 $x = 1$  to  $x = e$ .

### Section 9.4

5. Find the surface area obtained by revolving the given curve about the indicated axis.
  - a.)  $y = 2x^3$ ,  $0 \leq x \leq 1$  about the  $x$  axis.
  - b.)  $y^2 = x + 2$ ,  $1 \leq y \leq 3$  about the  $x$  axis.
  - c.)  $y = x^2 + 1$ ,  $0 \leq x \leq 1$ , about the  $y$  axis.
  - d.)  $y = \sqrt{4x}$ ,  $0 \leq x \leq 1$ , about the  $x$  axis.
  - e.)  $x = \ln(3y + 1)$ ,  $0 \leq y \leq 2$ , about the  $y$  axis. Set up a  $dx$  integral and a  $dy$  integral. Do not evaluate either integral.
  - f.)  $x = 3t - t^3$ ,  $y = 3t^2$ ,  $0 \leq t \leq 2$ . about the  $y$  axis.

### Section 9.5

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 centroid of the region bounded by  $y = e^x$ ,  $x = 0$ ,  $x = 3$  and  $y = 0$ .
8. Find the centroid of the region bounded by  $y = x^2$  and  $y = 4x$ .