

## Fall 2005 Math 152

### Week in Review 2

*courtesy: Amy Austin*

(covering sections 7.2 - 7.3)

### Section 7.2 and 7.3

1. Find the volume of the solid obtained by rotating the region bounded by the given curve(s) about the specified axis.

a.)  $y = \cos(x)$ ,  $x = 0$ ,  $x = \frac{\pi}{2}$ ,  $y = 0$  about the  $x$  axis. Note:  $\cos^2 x = \frac{1}{2}(1 + \cos(2x))$ .

b.)  $y = \ln x$ ,  $y = 0$ ,  $y = 1$ ,  $x = 0$  about the  $y$ -axis.

c.)  $y = \frac{1}{x}$ ,  $y = 0$ ,  $x = 1$ ,  $x = 10$ . Rotate around the  $y$ -axis.

d.)  $y^2 = x$ ,  $x = 0$ ,  $y = 2$ ,  $y = 5$ . Rotate around the  $x$ -axis.

e.)  $y = x^2$ ,  $y = 0$ ,  $x = 1$ ,  $x = 2$ . Rotate around the line  $x = 4$ .

f.)  $y = \cos x$ ,  $y = 0$ ,  $x = 0$ ,  $x = \frac{\pi}{2}$ . Rotate around the line  $y = 1$ . Set up both a  $dx$  and  $dy$  integral that gives the volume. Do not evaluate the integral.

g.)  $y = e^x$ ,  $y = 0$ ,  $x = 0$ ,  $x = 1$  about the  $x$ -axis.

h.)  $y = 2x - x^2$ ,  $y = 0$ . Rotate around the  $y$ -axis.

i.)  $x = \sqrt[4]{y}$ ,  $x = 0$ ,  $y = 16$ . Rotate around the  $x$ -axis.

2. Find the volume of the solid described below:

The base of  $S$  is the parabolic region

$\{(x, y) | x^2 \leq y \leq 1\}$  and cross sections perpendicular to the  $y$  axis are equilateral triangles.