
SAMPLE EXAM II – MATH 136, SPRING 2008

- **Problem 1**

Sketch the region enclosed by the curves below and find the **area of the region**.

$$x = 2y^2, \quad x = 4 + y^2$$

- **Problem 2**

Find the **volume of the solid** obtained by rotating the region bounded by the curves

$$y = x, \quad y = \sqrt{x}, \quad \text{about the line } y = 1.$$

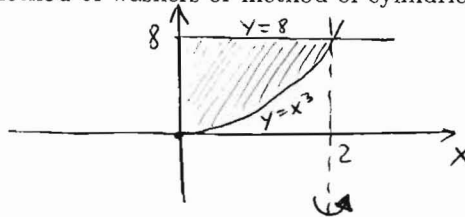
- **Problem 3**

Using the **method of cylindrical shells**, find the volume of the solid obtained by rotating the region bounded by the curves

$$x = 1 + y^2, \quad x = 0, \quad y = 1, \quad y = 2, \quad \text{about the } x\text{-axis}$$

- **Problem 4**

Set up, but **DO NOT** evaluate, an integral for the volume of the solid in the figure below. Specify which method was used (method of washers or method of cylindrical shells).



- **Problem 5**

Find the length of the curve

$$y = \frac{1}{6}(x^2 + 4)^{3/2}, \quad 0 \leq x \leq 3$$

- **Problem 6**

Set up, but **DO NOT** evaluate, an integral for the length of the curve

$$y = x \ln x, \quad 1 \leq x \leq 3$$

- **Problem 7**

Sketch the region bounded by curves given below and find the coordinates of the centroid.

$$y = e^x, \quad y = 0, \quad x = 0, \quad x = 1$$

- **Problem 8**

Solve the differential equation

$$y' = y^2 \sin x.$$