

Due at the beginning of class on the day of Test 1

Direction: Solve the problems in this worksheet on separate sheets of paper. Write your solution neatly. Use standard size paper. Clearly label each problem, and include each problem in the correct order. No ragged edges. Staple multiple pages. At the top of the first page put your name, Math 2414, and the title of the worksheet. Show all work to justify your answer. Answer with insufficient work will receive no credit.

Problem 1: Find area of a surface of revolution: $y = f(x)$

Find the area of the surface generated by revolving the curve on the interval about the given axis

- 1. $y = \frac{1}{3}x^3$ over $[0, 3]$ about the x -axis.
- 2. $y = 1 - \frac{x^2}{4}$ over $[0, 2]$ about the y -axis.

Problem 2: Find area of a surface of revolution: $x = g(y)$

Find the area of the surface generated by revolving the curve on the interval about the given axis

- 1. $x = \frac{1}{3}(y^2 + 2)^{3/2}$ over $1 \leq y \leq 2$ about the x -axis.
- 2. $x = \sqrt{1 + 4y}$ over $1 \leq y \leq 5$ about the y -axis.

Problem 3: Application

The measures of the radius (in inches) of a vase at the vertical distance y inches from the base are shown in the following table

y	0	3	6	9	12	15	18
r	8	10.4	11.1	10.5	9.2	8.1	7.6

- 1. Use a graphing calculator to find a cubic function $x = g(y)$ that models the data.
- 2. Set up the integral and use the integration capability of the calculator to find the surface area of the vase.