**Chapter 7 Review**

1. Find the area between two curves.
2. Find the volume of a solid of revolution
   1. Disc Method:
   2. Washer Method:
   3. Shell Method:
3. Find the length of a curve: d
4. Find the surface area:
5. Find the work
   1. required to pump fluid out of a tank:
   2. required to compress or stretch a spring:
6. Find the fluid force exerted on a vertical surface:

* All formulas above can be written in terms of *dy* (instead of *dx*)

**Problems**

1. Find the area of the region bounded by  , **** and the x-axis.
2. Calculate the volume of the solid of revolution obtained by rotating the region in Quadrant I bounded by  , y = x about the line x = 2.
3. Consider the region bounded by  and y = 4x in Quadrant I. Set up the appropriate integrals for finding the volumes of revolution using the specified method and rotating about the specified axis. (Note: SET UP THE INTEGRALS ONLY. DO NOT evaluate the integral)
4. Disc/washer method about the x-axis
5. Shell method about the x-axis
6. Disc/washer method about the line x = -3
7. Shell method about the line x = 4
8. Find the amount of work done in pumping all of the water out of a cone and up 2 feet above the cone if the top radius is 4 feet and height is 10 ft. Use the fact that water weighs 62.5 lb/ft3.
9. A force of 16 lb is necessary to stretch a spring 0.5 feet past its natural length. How much work is done in stretching the spring 1.5 feet longer than its natural length? (Hint: use Hook’s Law: F = *k* x, where x represents distance that the spring is stretched past its natural length)
10. Find the lengthof the curve 
11. Set up, but **DO NOT EVALUATE**, an integral for the area of the surface obtained by rotating the curve  about the x-axis.
12. Find the area of the surface obtained by rotating  about the y-axis.
13. Find the areas of the surfaces generated by revolving the curves in problems 1-4 about the axes indicated:

a) , about the -axis. Check your result with a formula from geometry.

b) , about the -axis.

c) , about the -axis.

d) , about the -axis.

1. The vertical side of a tank is a semicircle (lower half of a circle) with radius 2 ft. If the tank is full of water, find the fluid force on its vertical side. Use the fact that the weight density of water is 62.5 lb/ft3

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**Answers**

1. 10/3
2. a.

b.

c.

d.

4) ft-lb

5) ft-lb

6)

7)

8)

9a).  9b)  9c)  9d). 

10) or