**Math 252 -- Calculus II -- Lab 7 -- Winter 2019**

**Names:**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(include last names)

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*We agree that everyone whose name is on this lab contributed fairly to the final paper. If someone has not contributed sufficiently, we will take their name off this worksheet, and they should turn in an individual paper.*

**Labs are best if done in your group, during lab time.**

Late labs will be penalized 20%, and will only be accepted up to one week late.

Any group lab turned in by an individual will be penalized 10%.

**Rules:**

Work together:

Everyone works on the same problem at the same time.

Everyone agrees on the solution before you move on.

Remember that you are practicing your mathematical

communication skills!

Turn in one paper per group. Make sure that the paper you turn in is clean, clear, and organized.

**Part 1:** Practice Improper Integrals -- first sketch the area that each one represents (include scale numbers!), then do the integration. In showing your work, be sure to use proper limit notation.

**(1) **

**(2) **

**(3) **

**(4)** 

**Part 2: Practice MEASUREMENTS for volume problems**

*For each problem:*

1. Graph the interesting area, including scale numbers. Make the interesting area big enough to see easily. Lightly shade the interesting area. Graph the axis of rotation. Make sure that intersection points are clearly graphed.
2. Draw the appropriate representative rectangle.
3. Decide (and write down) whether the shape created by the rotation of your rectangle is a disk, washer, or cylindrical shell.
4. Label and list the measurements of your shape, using exactly this list of measurements:

|  |  |  |
| --- | --- | --- |
| disk | washer | cylindrical shell |
| thickness =  start value =  end value =  radius = | thickness =  start value =  end value =  R =  r = | thickness =  start value =  end value =  radius =  height = |

1. Set up an integral to find the volume of the solid of rotation.
2. **STOP! Don't do anything else.**

**(1)** area bounded by: , .

rotate around: .

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The shape generated by vertical rectangle will be a...

measurements:

volume integral:

**(2)** area bounded by: , .

rotate around: .

****

The shape generated by horizontal rectangle will be a...

measurements:

volume integral:

**(3)** area bounded by: , .

rotate around: .

The shape generated by vertical rectangle will be a...

measurements:

volume integral:

****

**(4)** area bounded by: , .

rotate around: .

The shape generated by horizontal rectangle will be a...

measurements:

volume integral:

****