

## HOMWORK #19 and Worksheet 12

Due Friday, May 13 in Gradescope by 11:59 pm ET.

### Volumes of Revolution

For all problems, make sure to Sketch both the bounded 2-D region and the 3-D solid. Also, Sketch one Approximating Rectangle on the 2-D sketch and then one Approximating Disk or Washer on the 3-D sketch.

Please write all Formulas clearly before substituting.

1. Consider the region bounded by  $y = 1 - x^2$  and  $y = 0$ . Rotate this region about the  $x$ -axis. **Compute** the resulting Volume. Sketch.
2. Consider the region bounded by  $\sqrt{x-1}$  and  $y = 0$  and  $x = 5$ . Rotate this region about the  $x$ -axis. **Compute** the resulting Volume. Sketch.
3. Consider the region bounded by  $y = x$  and the  $x$ -axis and between  $x = 0$  and  $x = 3$ . Rotate about the horizontal line  $y = -2$ . **Compute** the resulting Volume. Sketch.
4. Consider the region bounded by  $y = e^x$  and  $y = x$  and between  $x = 0$  and  $x = 2$ . Rotate this region about the line  $y = -1$ . Set-Up **but DO NOT COMPUTE** the integral that represents the resulting Volume. Sketch.
5. Consider the region bounded by  $y = x^2$ ,  $y = 1$  and  $x = 0$ , with  $x \geq 0$ . Rotate the region about the  $x$ -axis. Set-Up **but DO NOT COMPUTE** the integral that represents the resulting Volume. Sketch.
6. Consider the region bounded by  $y = e^x + 1$  and  $y = 4$  and  $x = 0$ .
  - (a) **Compute** the Area of the original bounded region in 2 Dimensions.
  - (b) Rotate the bounded region about the  $x$ -axis. Set-Up **but DO NOT COMPUTE** the integral that represents the resulting Volume. Sketch.
7. Consider the region bounded by  $y = \cos x$  and  $y = \sin x$  and between  $x = 0$  and  $x = \frac{\pi}{4}$ . Rotate about the horizontal line  $y = -1$ . Set-Up **but DO NOT COMPUTE** the integral that represents the resulting Volume. Sketch.

# REGULAR OFFICE HOURS

**Monday: 1:00–3:00 pm**

**Tuesday: 12:00–4:00 pm**

7:30–9:00 pm TA Bobby, SMUDD 205

**Wednesday: 1:00-3:00 pm**

**Thursday: none for Professor**

7:30–9:00 pm TA Bobby, SMUDD 205

**Friday: 12:00–2:00 pm**

- LAST ONE!!!!!!!!!!
- Please fill out evaluations from your email.
- Prepare for the Final Exam using the Study guides and Calendar.