

Math 131 Day 15

Practice

My Office Hours: M & W 12:30–2:00, Tu 2:30–4:00, & F 1:15–2:30 or by appointment. **Math Intern** Sun: 12–6pm; M 3–10pm; Tu 2–6, 7–1pm; W and Th: 5–10 pm in Lansing 310. Website: <http://math.hws.edu/~mitchell/Math131S13/index.html>.

1. a) Review 6.3 and read in 6.4 for another method of calculating volumes of rotation.
b) Examples 1 through 4 in Section 4.3 are quite good. Try: Page 397 # 23, 25, 27 29 (Half-angle!), 31, 33, 43.
2. Find the volume of the solid that results when the region enclosed by the given curves is revolved about the x -axis. (We may not get this far.)
 - a) $y = x^2$, $x = 0$, $x = 2$, $y = 0$. (Answer: $32\pi/5$)
 - b) $y = 1/x$, $x = 1$, $x = 4$, $y = 0$. (Answer: $3\pi/4$)
 - c) $y = 9 - x^2$, $y = 0$. (Answer: $1296\pi/5$)
 - d) $y = x^2$, $y = 4x$. (Answer: $2048\pi/15$)
 - e) $y = \sqrt{x}$, $y = x$. (Answer: $\pi/6$)
3. Find the volume of the solid that results when the region enclosed by the given curves is revolved about the y -axis. The principle is the same, but you will need to solve for x in terms of y .
 - a) $y = x^2 - 1$, $x \geq 0$, $y = 3$. (Answer: 8π)
 - b) $y = x^2$, $x = y^2$. (Answer: $.3\pi$)

XC: CS Talk Tuesday

Thoracic Biometrics: Investigations of the Human Heartbeat as a Biometric: Dr. Eric McGregor, (Candidate for Assistant Professor in Computer Science), Tuesday, February 26st at 5:00pm, Napier 101. Refreshments will be served before the talk.

Hand In

The integrations for the written problems are not hard. But you do have to be careful setting up the integrals for the volume. **Make sure to draw the region being rotated.** Some possible answers: 2, 4, 6, 6π , 8π , $8\pi/3$, $10\pi/3$, $\pi/2$, $\pi^2/4$, $\frac{\pi(e^4-1)}{2}$, $\frac{\pi(e^2-1)}{2}$, $16384\pi/3$, $32768\pi/3$, $128\pi/7$, $256\pi/7$.

0. WeBWork Day15. Due Thursday, start early. (Also complete Day14).
1. Basic: Let R be the region enclosed by $y = x^3$, $x = 2$, and the x -axis. Rotate R about the x -axis and find the resulting volume.
2. Page 400 #10. Since you will be integrating along the y -axis, first solve for x in terms of y . (Not a rotation.)
3. Page 400 #18. Use the hint.
4. Page 401 #24.
5. Page 401 #32.
6. Let R be the region enclosed by $y = 3/x$ and $y = 4 - x$.
 - a) Rotate R around the x -axis and find the resulting volume.
 - b) Just set up the integral for the rotation of R around the y -axis. Without doing any more work, what is the answer?
7. Find the volume of the solid obtained by rotating the region enclosed by $y=x^2$, $y=6-x$, $y=0$ (x -axis) about the x -axis can be computed using the method of disks. (Is it a sum or outside minus inside?) Determine the volume. (This is WeBWorkDay 15 problem 9. Check your answer.)