My Office Hours: M & W 2:30–4:00, Tu 2:00–3:30, & F 1:30–2:30 or by appointment. **Math Intern:** Sun: 2:00–5:00, 7:00–10pm; Mon thru Thu: 3:00–5:30 and 7:00–10:30pm in Lansing 310. Website: `http://math.hws.edu/~mitchell/Math131F15/index.html`.

1. Review your exams. See answers on the following pages.

2. (*a*) Review 6.3 and read in 6.4 for another method of calculating volumes of rotation.

(*b*) Examples 1 through 4 in Section 6.4 are quite good. Try: Page 431 #27, 29, 31, 33(Half-angle!), 35, 37, 55.

3. 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: $\pi/6$)

4. 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: $.3\pi$)

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: $\pi/3$, 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 Tuesday, start early.

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 430 #12. Since you will be integrating along the y-axis, first solve for x in terms of y. (Not a rotation.)

3. Page 431 #20. Use the Half-angle Formula in the hint.

4. Page 431 #28.

5. Page 432 #36.

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 $y = x^2$, $y = 6 - x$, and $y = 0$ (the 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.)

8. On a Calculus II exam Kelly determines that the upper Riemann sum for $f(x) = 1 + \frac{x^2}{2}$ on the interval $[0, 2]$ is $\text{Upper}(n) = \frac{10}{3} + \frac{2}{n} + \frac{2}{3n^2}$. Using appropriate limit notation, help her express the integral of $f(x)$ on this interval as a limit. [Hint: See the answers to your test.]