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`.

Practice

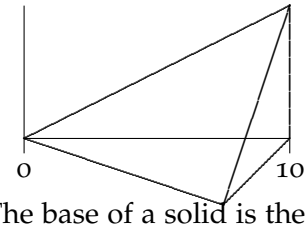
1. **Test 1** Thursday in Lab. See Day 12 handout and website.
2. (*a*) Read 6.3 about the Disk or Slicing Method to calculate volumes. We will finish this material on Friday.
   (*b*) Begin to read 6.4 about volume by shells. Because of the three-dimensional nature of these problems, students often have difficulty with them. ☞ **Effort made now will pay off later.**
3. **Try this**: A crystal prism is 10 cm long (see bottom of page figure on the left). Its cross-sections are isosceles right triangles. The heights are formed by the curve $y = x/2$. Find the volume of the prism. (Answer: $125/3$ cu. cm)

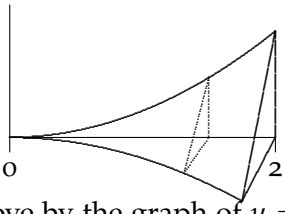
Hand In

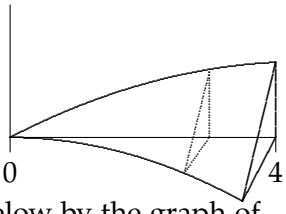
Extra Credit: WeBWorK Day14Bonus: Determine the area enclosed by $y = x\sqrt{2x+3}$ and $y = x^2$.

The answers for the next three are included in this list: $256\pi/15$, $256/15$, $256/7$, $16/5$, $64/7$, $512/15$ $128\pi/7$, $128/7$, $32/5$.

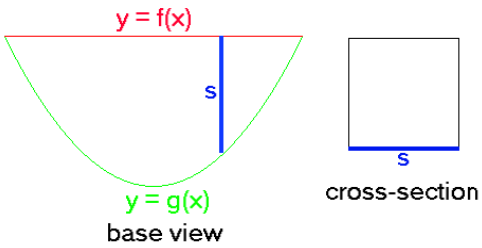
1. A crystal prism is 2 cm long (center figure below). Its cross-sections are isosceles right triangles. The heights are formed by the curve $y = x^2$. Find the volume of the prism. Label the base and height of the triangle cross-section in the figure.
2. A crystal prism is 4 cm long (right figure below). Its cross-sections are right triangles. The heights are formed by the curve $y = 2\sqrt{x}$ and the bases by the curve $y = x^2$. Find the volume of the prism.







3. The base of a solid is the area bounded above by the graph of $y = f(x) = 4$ and below by the graph of $y = g(x) = x^2$. Cross-sections perpendicular to the x-axis are squares. (See below.) So $A(x) = s^2$. Figure out what s using $f(x)$ and $g(x)$. Use the formula $V = \int_a^b A(x)\,dx$ to find the volume of the solid.



4. **Extra Credit**. Find the number k so that the horizontal line $y = k$ divides the area enclosed by $y = \sqrt{x}$, $y = 2$, and the y axis into two equal pieces. Draw it first. This is easier if you integrate along the y axis.
5. **Real Extra Credit**. There is a line $y = mx$ through the origin that divides the area between the parabola $y = x - x^2$ and the x axis into two equal regions. Find the slope of this line. Draw it first. The answer is not a simple number. (Also see WeBWorK Day14Bonus.)