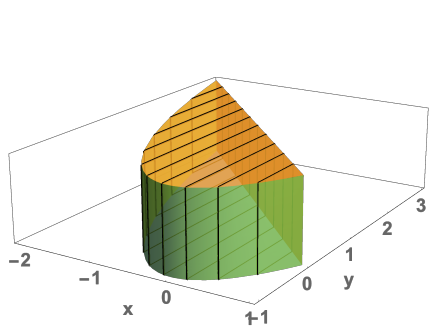
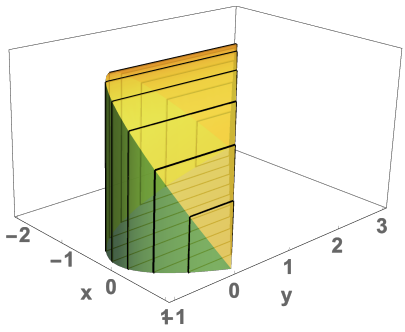
The following written homework problems are due at 6pm on Gradescope, the night before your class. You also have a WebWork assignment due at 11pm two days before your class.

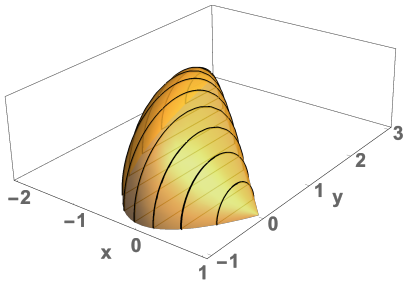
(8.1) Set up, but do not evaluate, integrals to find the volume of each solid below. The base of each solid is the region bounded by the graphs of $y = 1 - x$ and $y = x^2 - 1$. The cross sections perpendicular to the x-axis are described below each solid.



(a) Rectangles of height 2



(b) Squares



(c) Semicircles

(8.2) Let S be the solid generated by rotating the region bounded by $y = x$ and $y = x^2$ about the line $y = -1$.

(a) Sketch S.

(b) Use the method of washers to set up and evaluate an integral to find the value of S. Sketch a representative cross-section on your drawing of S.

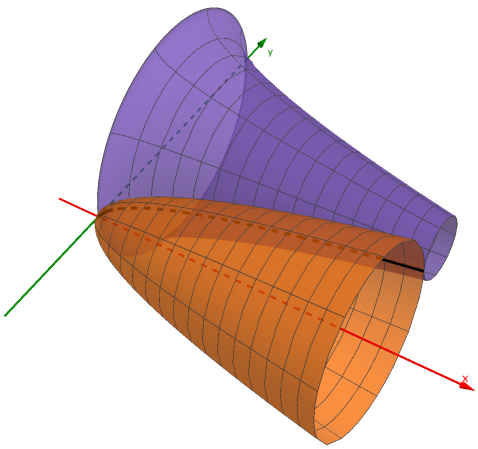
(8.3) Let S be the solid generated by rotating the region bounded by $y = x$ and $y = x^2$ about the line $x = -1$.

(a) Sketch S.

(b) Use the method of cylindrical shells to set up and evaluate an integral to find the value of S. Sketch a representative cylinder on your drawing of S.

(8.4) (a) In the picture below, the orange "nose cone" shape is a solid of revolution created by rotating the graph of $f(x) = \sqrt{x}$, $0 \le x \le 9$, about the x-axis. Find its volume.

(b) The purple "funnel" shape in the picture is also a solid of revolution, created by rotating the same graph about a *different* line $y = k$, for some $k > 0$. It has the same volume as the orange shape. Find k.



As always, refer to the "Professional Problem information" handout to create a *professionally written* solution. This week, you should especially focus on:

Explanation: Justify relevant steps appropriately. One or more pictures is likely necessary to write a clear solution. Don't over-show algebra.

Methods: Use appropriate methods from Section 6.2.

Organization: Organize your computations and explanations clearly. Center important equations but leave less important ones inline. Use complete sentences.

You should have questions!

When you do, here's what to do:

1. Post your question on Canvas.
2. Email *all* of the instructors with your question.
3. Write your solution (even if you're unsure about it) and bring it to the study session. Ask an instructor specific questions about it.

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