

Required reading:

- Larson 9e: pages 469-473
- Dawkins: Calculus I, section 6-4: Volume with Cylinders
<http://tutorial.math.lamar.edu/Classes/Calcl/VolumeWithCylinder.aspx>
 - Notes: Read all. (Last modified: 05/30/2018)
 - Practice Problems: Review all. (Last modified: 02/28/2018)

Required homework:

- Larson 9e: page 474, problems 9, 11, 19, 21, 23, 25
- Dawkins: Assignment problems 3, 16c (Last modified: 02/28/2018)

Additional comments regarding this topic:

In AP Calculus BC, we saw two different methods of finding volumes of revolution: discs/washers and known cross sections. We now see a third method, using cylindrical shells.

Additional comments regarding the Larson reading:

On page 469, we see how to determine the volume of a shell. Let $a = p + \frac{w}{2}$, and $b = p - \frac{w}{2}$. Then we have:

$$\begin{aligned}\text{volume of shell} &= \pi(a^2)h - \pi(b^2)h \\ &= \pi h(a^2 - b^2) \\ &= \pi h(a + b)(a - b) \\ &= \pi h(2p)(w) \\ &= 2\pi phw \\ &= 2\pi(\text{average radius})(\text{height})(\text{thickness})\end{aligned}$$