

Math 221 Homework #7

1. Compute the volume of the object obtained by revolving the region between the graphs of the functions $x = y - y^2$ and $x = 0$ about the y -axis. Sketch the region in question as well as the spatial object whose volume is being computed.
2. Use the method of shells to compute the volume of the object obtained by revolving the region between the graphs of the functions $x = y - y^2$ and $x = 0$ about the x -axis.
3. Give a careful and complete derivation, using either the method of discs or the method of shells, of the formula $V(R) = \frac{4}{3}\pi R^3$ for the volume of the solid ball of radius R .
4. [SM] 2.1 #20,35,44.
5. [SM] 2.2 #4,9,50,62. For problem #50, describe in words the meaning of each of these derivatives, including the appropriate units.

Reminder: In problems 1–3, you may use the formula

$$\int_0^L x^p dx = \frac{L^{p+1}}{p+1}$$

for $L > 0$ and $p = 0, 1, 2, \dots$, as discussed in class.