

**Mat 115 Worksheet 7**  
**Tuesday, Oct 24 2017**

**Name:**

**Important info:** Welcome to the MAT 115 workshops! My name is **Diego Avalos** (avalosgalvez@cpp.edu), and I will be your workshop facilitator. We meet on Tuesdays and Thursdays from 4 to 5:50 pm. My office hour is on Mondays from 11:30 am to 12:30 pm in room 94-219. All worksheets and solutions may be found at the website [www.diegoavalos.net/teaching/mat115workshop2017](http://www.diegoavalos.net/teaching/mat115workshop2017).

Use the slicing method for problems 1 to 4.

- Find the volume of the solid that results when the region enclosed by the given curves is revolved about the  $x$ -axis
  - $y = \sqrt{25 - x^2}, y = 3$
  - $x = \sqrt{y}, x = y/4$
- Find the volume of the solid that results when the region enclosed by the given curves is revolved about the  $y$ -axis
  - $x = \csc y, y = \pi/4, y = 3\pi/4, x = 0$
  - $x = y^2, x = y + 2$
- Find the volume of the solid whose base is the region bounded between the curve  $y = x^3$  and the  $y$ -axis from  $y = 0$  to  $y = 1$  and whose cross sections taken perpendicular to the  $y$ -axis are squares.
- A nose cone for a space reentry vehicle is designed so that a cross section, taken  $x$  ft from the tip and perpendicular to the axis of symmetry, is a circle of radius  $\frac{1}{4}x^2$  ft. Find the volume of the nose cone given that its length is 20 ft.
- Use cylindrical shells to find the volume of the solid generated when the region enclosed by the given curves is revolved about the  $y$ -axis.
  - $y = x^3, x = 1, y = 0$
  - $y = 1/x, y = 0, x = 1, x = 3$
  - $y = 2x - 1, y = -2x + 3, x = 2$
- Use cylindrical shells to find the volume of the solid that is generated when the region that is enclosed by  $y = 1/x^3, x = 1, x = 2, y = 0$  is revolved about the line  $x = -1$ .
- Use cylindrical shells to find the volume of the torus obtained by revolving the circle  $x^2 + y^2 = a^2$  about the line  $x = b$ , where  $b > a > 0$ .