

NAME: _____

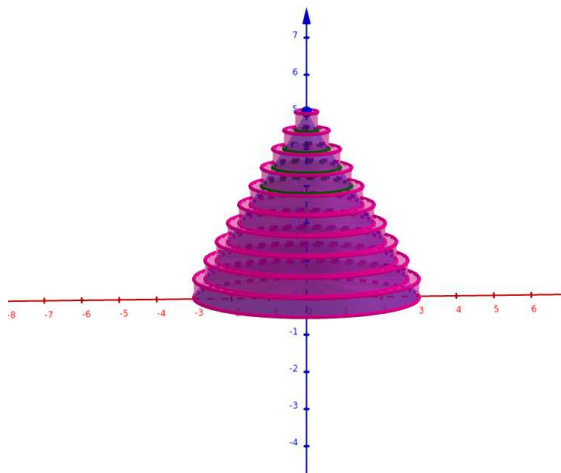
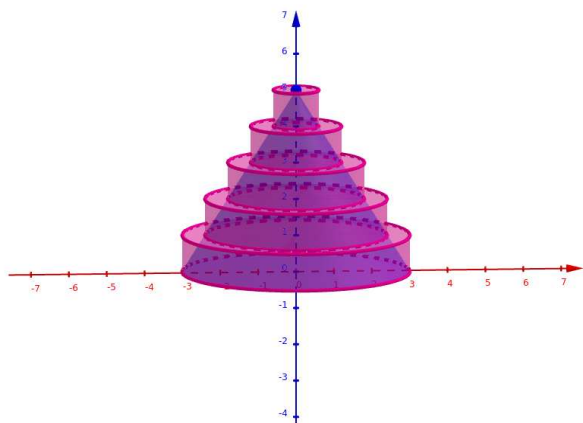
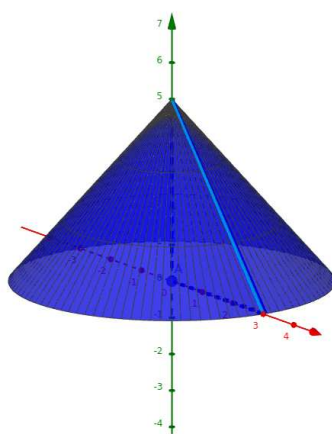
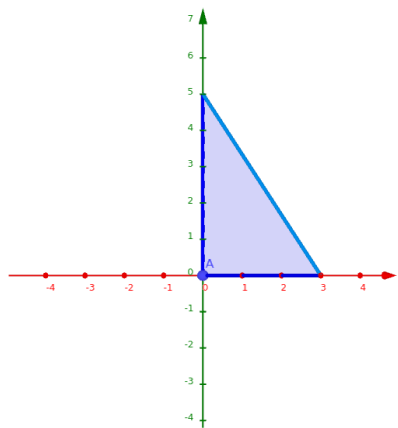
LESSON 14 - SOLIDS OF REVOLUTION - DISKS
MATH 16020

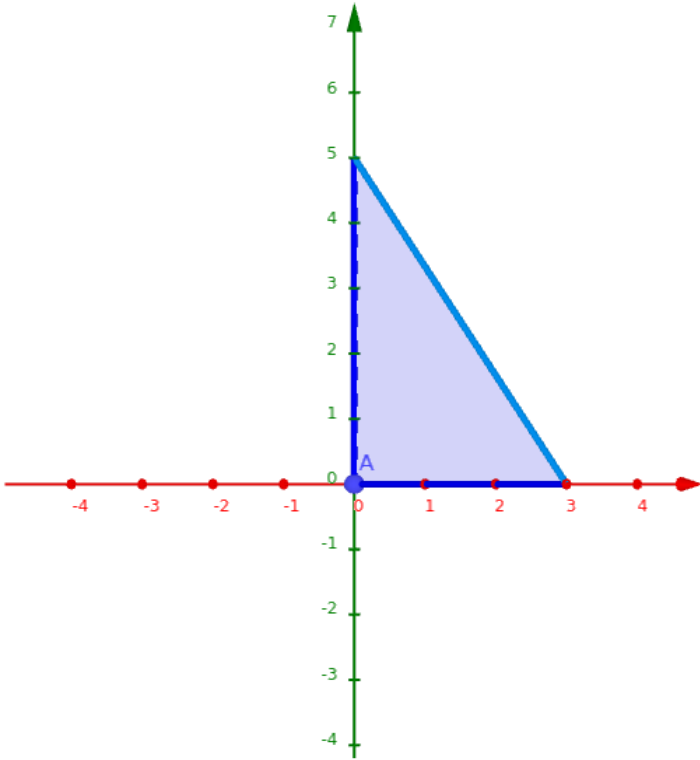
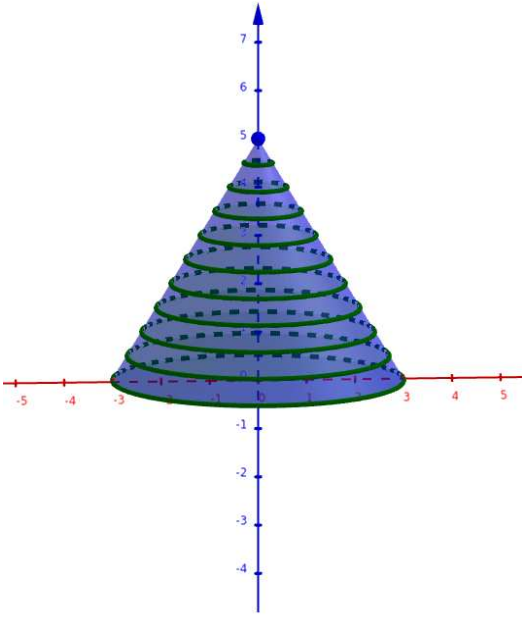
III Volume

Example 1. Find the volume of the solid that results by revolving the region enclosed by the curves

$$x = 3 - \frac{3}{5}y, \quad y = 0, \quad \text{and } x = 0$$

around the y -axis.





Example 2. Find the volume of the solid that results by revolving the region enclosed by the curves

$$y = 4x - x^2 \text{ and the } x\text{-axis}$$

around the x -axis.

Example 3. Set up an integral to find the volume of the solid. **DO NOT** evaluate the integral.

(a) The region enclosed by the curves $y = \csc(x)$, $x = \frac{\pi}{6}$, $x = \frac{\pi}{2}$, and $y = 0$ is revolved around the x -axis.

(b) The region *in the first quadrant* enclosed by the curves $y = x^4$, $y = 16$, and $x = 0$ is revolved around the y -axis.

(c) The solid obtained by rotating the ellipse $\frac{x^2}{3^2} + \frac{y^2}{5^2} = 1$ about the x -axis.

(d) The solid obtained by rotating the ellipse $\frac{x^2}{3^2} + \frac{y^2}{5^2} = 1$ about the y -axis.

III.1 You try it!

Problem 4. Find the volume of the solid that results by revolving the region enclosed by the curves

$$y = x^3, \quad y = 8, \quad \text{and } x = 0$$

around the y -axis. **ANSWER:** $\frac{96\pi}{5}$.

(This is example 3 in Section 6.2 of Stewart's 8th edition *Calculus: Early Transcendentals*.)