Lesson 14

Notes

Examples

Example 1. Let \mathcal{R} be the region of the *xy*-plane bounded above by the curve $x^3y = 1728$, below by the line y = 1, on the left by the line x = 6, and on the right by the line x = 12. Find the volume of the solid obtained by rotating \mathcal{R} around

(a) the line y = 1

(b) the line x = 6

Example 2. Find the volume of the solid generated by revolving the given region about the line y = 9:

 $y = -x^2 + 2x + 3$ and y = 3 - x.

Example 3. Find the volume of the solid generated by revolving the region enclosed by the curves

$$y = \sqrt{x}, \quad y = 0, \quad x = 4$$

about the line x = 9.

Example 4. A propane tank is in the shape generated by revolving the region enclosed by the right half of the graph of

$$x^2 + 81y^2 = 121 \quad \text{and the } y\text{-axis}$$

about the y-axis. If x and y are measured in meters, find the depth of the propane in the tank when it is filled to one-quarter of the tank's volume.