5.2 Volumes by Slicing; Disks and Washers

**Example 1**
Find the volume of the solid whose base is the region enclosed between the curve \( y = 1 - x^2 \) and the \( x \)-axis and whose cross sections taken perpendicular to the \( x \)-axis are squares.
Example 2
Derive the formula for the volume of a sphere of radius $r$ using circular cross-sections perpendicular to the $y$-axis.

Volume (by Method of Disks)
Example 3
Find the volume of the solid obtained by rotating about the $x$-axis the region under the curve $y = \sqrt{x}$ from 0 to 1.

Example 4
Find the volume of the solid that results when the region enclosed by the given curves is revolved about the $y$-axis.

$$y = 2 - x, \quad x = 0, \quad y = 0$$
Example 5
Find the volume of the solid that results when the region enclosed by the given curves is revolved about the y-axis.

\[ y = x^2, \quad x = y^2 \]
It is possible to use the methods from this section to find the volume of a solid of revolution whose axis of revolution is a line other than one of the coordinate axes...

**Example 6**
Find the volume of the solid that results when the region enclosed by $x = y^2$ and $y = x$ is revolved about the line $y = -1$. 