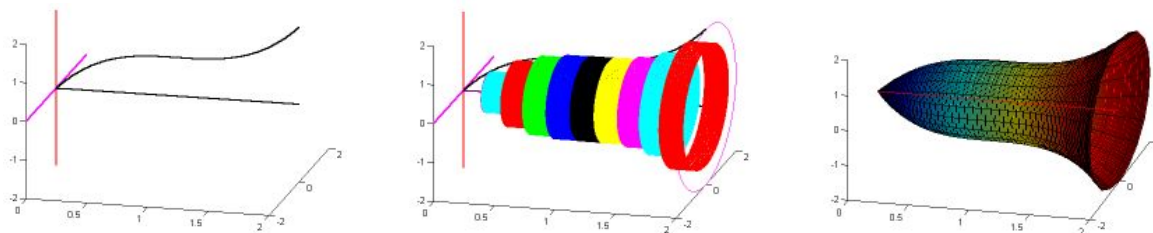


Volume by Disk Method

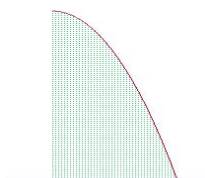
Create a 3-dimensional region is by rotating a function around a line. The rotation creates circular cross-sections that combine to create the volume. The resulting solid is called the **solid of revolution**, and the line that it revolved around is called the **axis of revolution**.

The area of each circle is $A = \pi r^2$, where r is distance from the function to the axis of revolution.

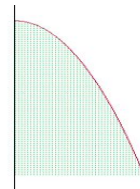


To find the volume of a solid of revolution with the disk method, use one of the following formulas:

Horizontal Axis of Revolution



Vertical Axis of Revolution



2. Using the Disk Method x-axis

Find the volume of the solid formed by revolving the region bounded by the graph of

$f(x) = \sqrt{\sin x}$ and the x -axis from $[0, \pi]$ about the x -axis.

3. Using the Disk Method y-axis

Find the volume of the solid formed by revolving the region bounded by the graph of $y = x^2 + 1$ and the y-axis for $1 \leq y \leq 5$ about the y-axis.

4. Revolving About a Line That is Not a Coordinate Axis

Find the volume of the solid formed by revolving the region bounded by $f(x) = 2 - x^2$ and $g(x) = 1$ about the line $y = 1$.

AB Calculus
8.3 Volumes (Disks)

Find the volume of the solid formed by revolving the region bounded by $y = \sqrt{x+1}$, $y = 3$, and $x = -1$ about the line $x = -1$.

Find the volume of the solid formed by revolving the region bounded by $y = x^2$, the x -axis, and $x = 2$ about the line $x = 2$.

Find the volume of the solid formed by revolving the region bounded by $y = x^2$, $y = 4$, and the y -axis, about the line $y = 4$.