Calculus

Write your questions and thoughts here!

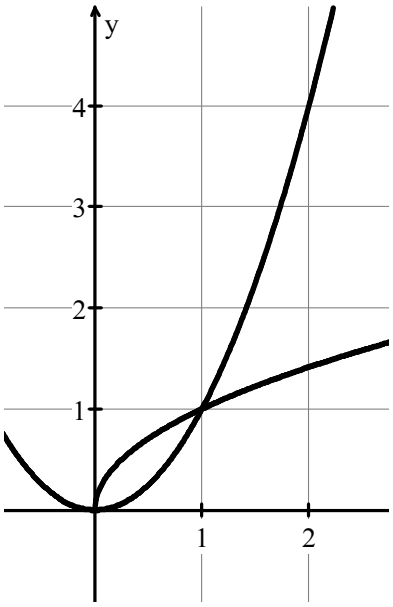
# 8.12 Washer Method: Revolve Around Other Axes

**Notes**

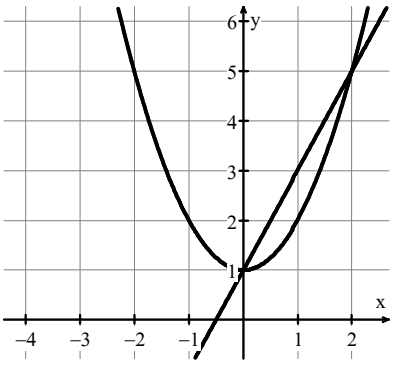
## Volume of a Solid of Revolution (washers)

$$V = \pi \int_a^b$$

1. Find the volume if the region enclosed by $y = \sqrt{x}$, and $y = x^2$ is rotated about the line $y = 2$.




2. Find the volume if the region enclosed by $y = x^2 + 1$ and $y = 2x + 1$ is rotated about the line $x = -1$.




This lesson will have a review of several topics from Unit 8, so you need to be able to distinguish what strategy to apply for each problem!

## 8.12 Washer Method: Revolve Around Other Axes

Calculus

**Practice**

**1. A region $S$ is bounded by the graphs of $y = x$, $x = 0$, and $y = 3$.**

a. Sketch the graph and find the area of region $S$.

b. Let $S$ be the base of a solid with cross sections perpendicular to the $x$-axis that form a square. Find the volume of this solid. [Use a calculator after you set up the integral.]

c. Let $S$ be the base of a solid with cross sections perpendicular to the $y$-axis that form a semi-circle. Find the volume of this solid. [Use a calculator after you set up the integral.]

Write the equation for the "big radius" and the "little radius" for the solid of revolution when revolving $S$ around the given line. Then setup the integral to find the volume of the solid formed. **DO NOT EVALUATE.**

d. The line $x = 3$.

$R =$

$r =$

$V =$

e. The line $y = -1$.

$R =$

$r =$

$V =$

f. The line $x = -1$.

$R =$

$r =$

$V =$

**2. A region $T$ is bounded by the graphs of $y = x^2$ and $y = 4x - x^2$.**

a. Sketch the graph and find the area of region $T$.

b. Let $T$ be the base of a solid with cross sections perpendicular to the $x$-axis that form a semicircle. Find the volume of this solid. [Use a calculator after you set up the integral.]

Write the equation for the "big radius" and the "little radius" for the solid of revolution when revolving $S$ around the given line. Then setup the integral to find the volume of the solid formed. **DO NOT EVALUATE.**

c. The line $y = 6$.

$R =$

$r =$

$V =$

d. The line $y = -3$.

$R =$

$r =$

$V =$

**3. A region $D$ is bounded by the graphs of $y = (x-3)^2 - 5$ and $y = -1$.**

a. Sketch the graph and find the area of region $D$.

b. Let $D$ be the base of a solid with cross sections perpendicular to the $x$-axis that form a rectangle with a height 3 times the width. Find the volume of this solid. [Use a calculator after you set up the integral.]

c. Let $D$ be the base of a solid with cross sections perpendicular to the $y$-axis that form an isosceles right triangle. Find the volume of this solid. [Use a calculator after you set up the integral.]

Write the equation for the "big radius" and the "little radius" for the solid of revolution when revolving $D$ around the given line. Then setup the integral to find the volume of the solid formed. **DO NOT EVALUATE.**

d. The line $y = 9$.

$R =$

$r =$

$V =$

e. The line $x = -2$.

$R =$

$r =$

$V =$

f. The line $x = 5$.

$R =$

$r =$

$V =$

No test prep for this lesson.