Math 1432

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Office Hours:

Mondays 1-2pm,
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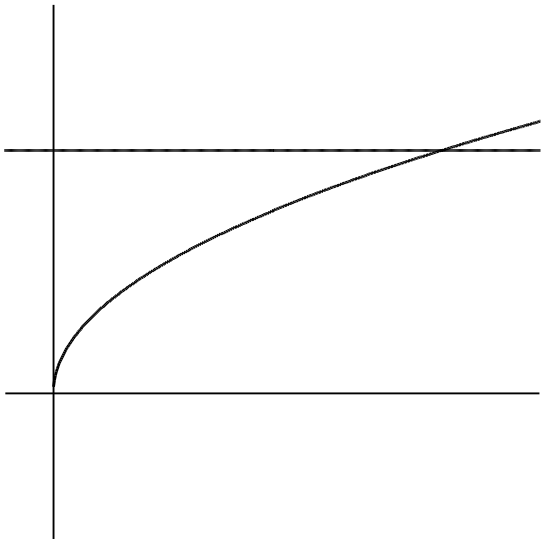
(also available by appointment)

Class webpage:

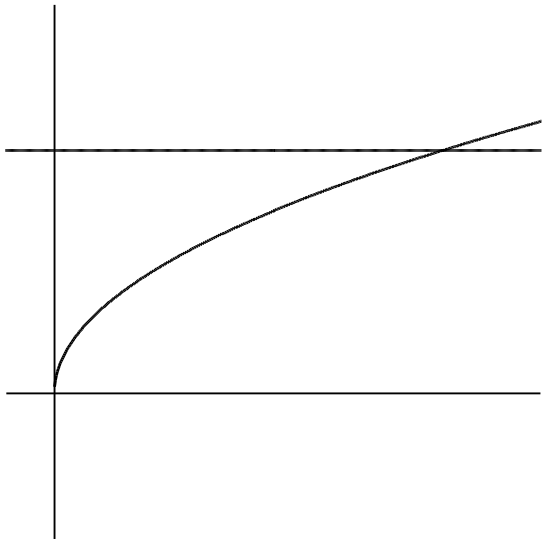
http://www.math.uh.edu/~bekki/Math1432.html

Find the volume of the region bounded by $y = \sqrt{x}$, $x = 0$, $y = 2$ being revolved about:

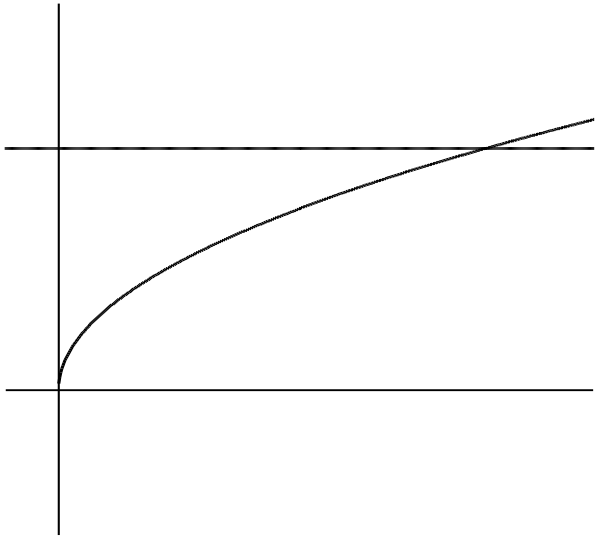
a. x – axis



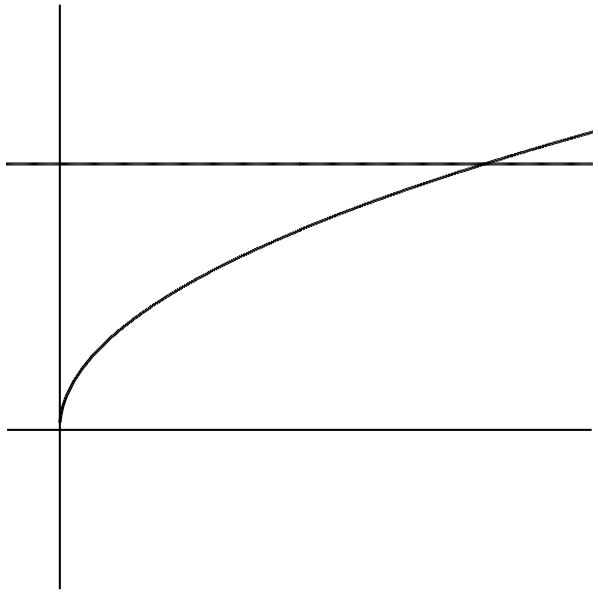
b. y – axis



c. $x = 4$



d. $y = 2$



Popper 02

1. The region *R* in the first quadrant is enclosed by the lines $x = 0$ and $y = 5$ and the curve $y = x^2 + 1$. The volume of the solid generated when *R* is revolved about the y-axis is

2. Let *R* be the region in the first quadrant bounded by the x-axis and the curve $y = 2x - x^2$. The volume produced when *R* is revolved about the x-axis is

3. Given the region in the first quadrant bounded by the function $y = 4 - x^2$, set up the integral equation that finds the volume of the region when rotated about $y = 0$.

4. Given the region in the first quadrant bounded by the function $y = 4 - x^2$, set up the integral equation that finds the volume of the region when rotated about $x = 0$.

5. Given the region in the first quadrant bounded by the function $y = 4 - x^2$, set up the integral equation that finds the volume of the region when rotated about $y = 4$.

6. Given the region in the first quadrant bounded by the function $y = 4 - x^2$, set up the integral equation that finds the volume of the region when rotated about $x = 2$.

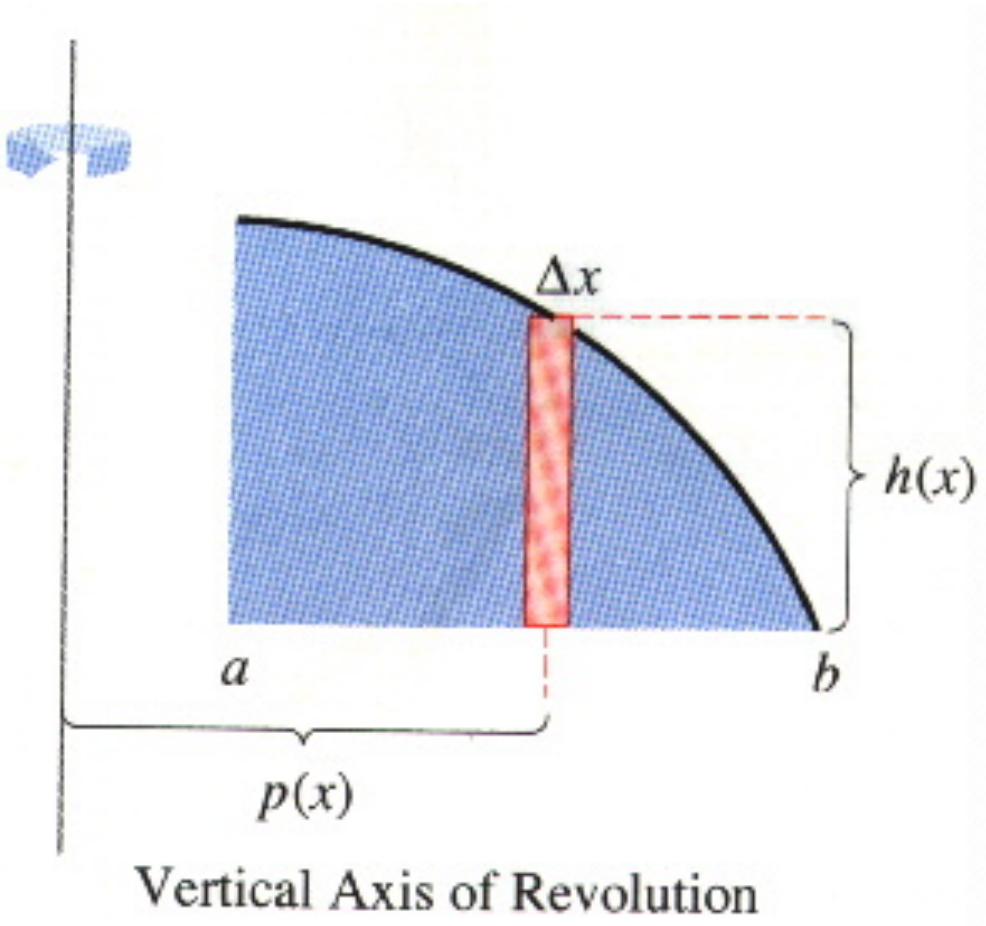
In the Disc Method, the rectangle of revolution is perpendicular to the axis of revolution.

Now for a different method to find volume of revolution:

In the Shell Method, the rectangle of revolution is parallel to the axis of revolution.

Revolving about the y-axis or a vertical axis:

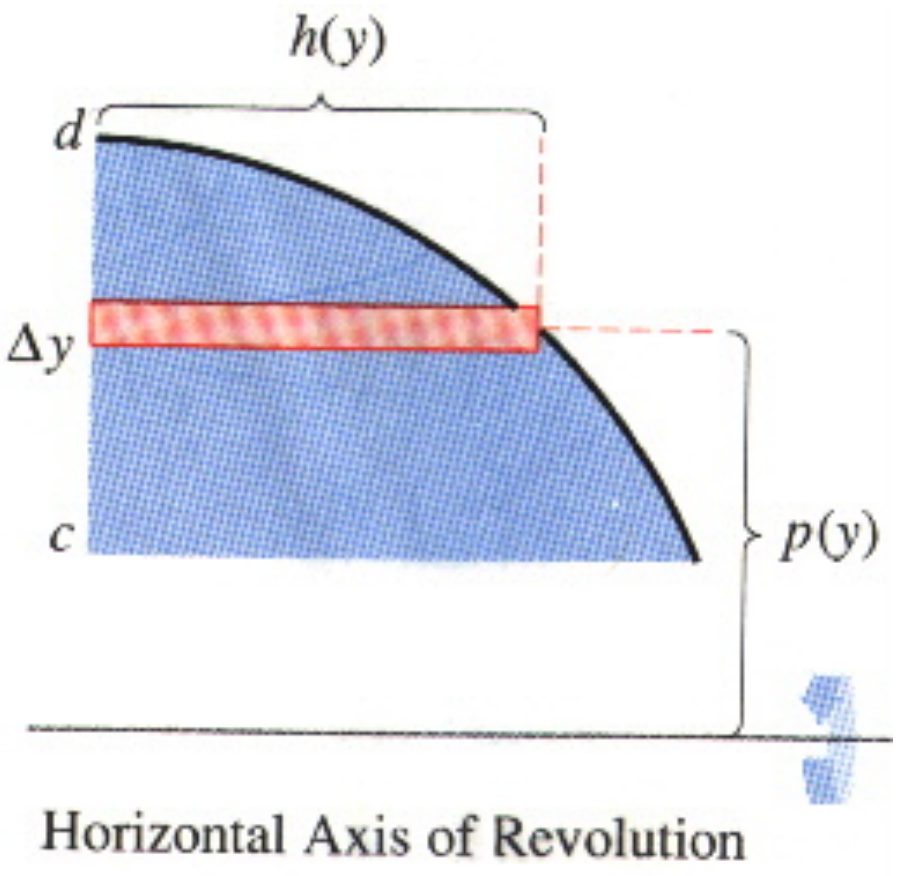
$$V = \int_a^b 2\pi\, p(x) h(x) dx$$



Vertical Axis of Revolution

Revolving about the x-axis or a horizontal axis:

$$V = \int_c^d 2\pi\, p(y) h(y) dy$$



$p(x)$; $p(y)$: Distance from the axis of revolution to center of revolution; radius

$h(x)$; $h(y)$: Height of rectangle (big – little), (top – bottom), (right – left)

dx; dy : Width of rectangle

Find the volume of the solid formed by rotating about the y – axis using the shell method.

$y = 1 - x$, $x = 0$, $y = 0$

Find the volume of the solid formed by rotating the region in the first quadrant about the y – axis using the shell method.

$y = x^2 + 4$, $x = 0$, $y = 8$

Find the volume of the solid formed by rotating about the x – axis using the shell method.

$y = 2 - x$, $x = 4$, $y = 0$

Give the formula for the volume of the solid formed by rotating about the y – axis using the shell method then by the disc method.

$y = x^2 + 1$, $x = 0$, $x = 1$, $y = 0$