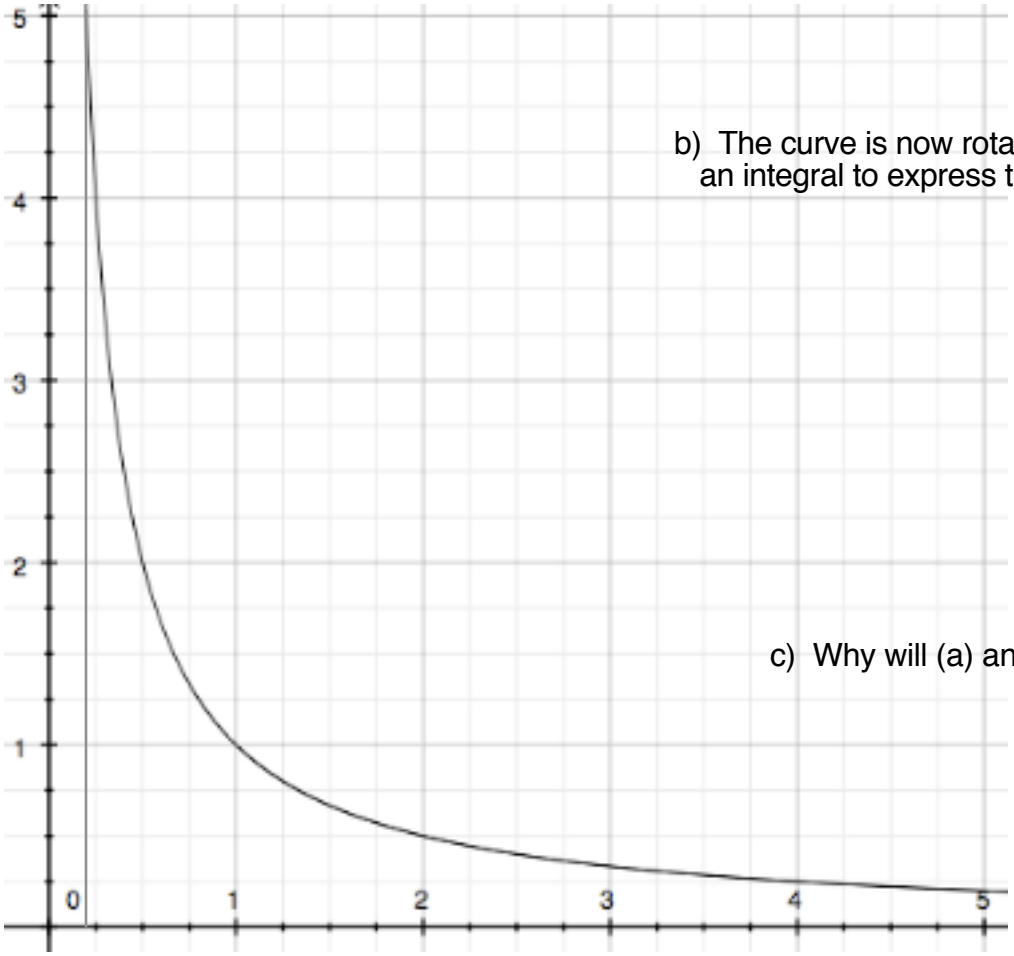
Name: _____

CLASSWORK 122

1. The curve y = 1/x is rotated around the x-axis.

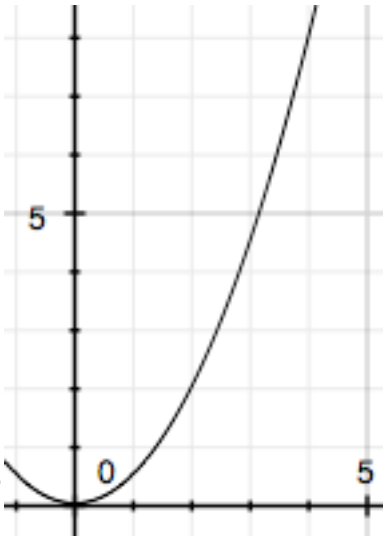
a) Find the volume of the figure created from x = .2 to x = 5.



b) The curve is now rotated around the **y-axis**. Write an integral to express the volume from **y** = .2 to **y** = 5.

c) Why will (a) and (b) yield the same answer?

2. a) The curve $y = 1/2x^2$ is rotated around the **y-axis** from y = 0 to y = 4. Find the volume created.



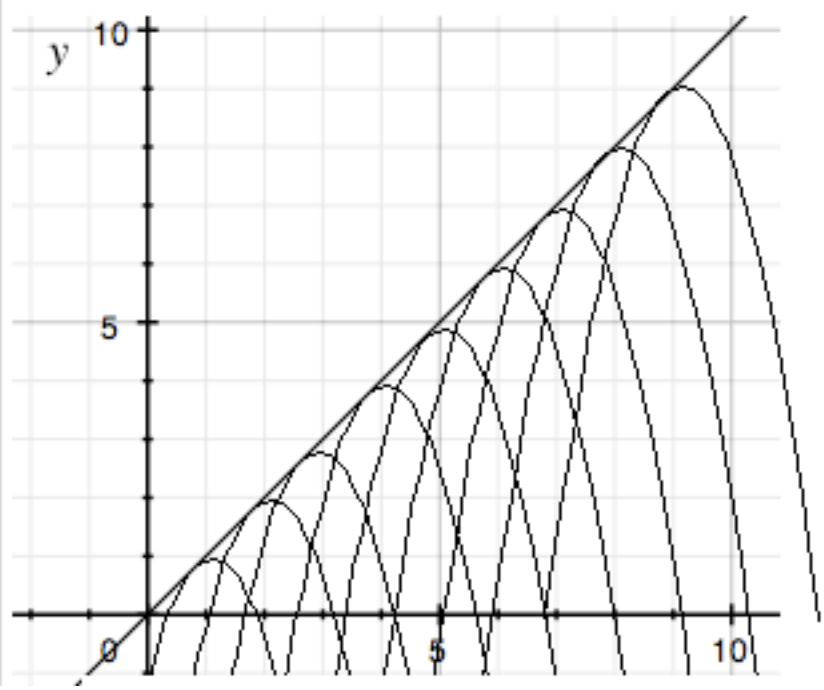
b) What curve could we rotate around the **x-axis** to create the same volume?

4. Lily makes a slanted wall from "parabolic" pieces of rock. Each rock is in the shape of the curve $y = -x^2$. At $x = 0$, the wall is 0 feet tall. At $x = 9$, the wall is 9 feet tall at its highest point. Find the volume of stone needed to construct such a wall.

a) Write a general integral for the volume of the whole figure.

b) Write an expression for the area of the back slab (where $x = 9$).

c) Write an expression for the area of the slab (cross-section) where $x = 4$.



d) Let **n** represent the x value that you pick from 0 to 9. Write an expression (formula) for the area of the cross section at $x =$ **n**.

e) Find the volume of the figure between $x = 0$ and $x = 9$.

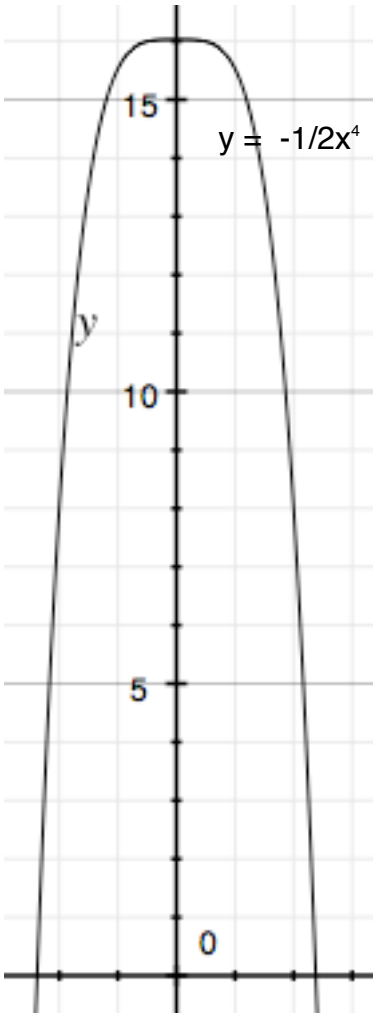
5. "Slices" in the shape of the curve $y = -1/2x^4$ are placed underneath the parabola $y = x^2$ from x = 0 to x = 4. Each slice is centered so that the maximum of the slice is on the parabola.

a) Write a general formula for the volume of the figure

b) Write an expression for the area of the slice at the very end, at x = 4.

c) Write an expression for the area of the slice if you cut at x = 2.

d) Write a formula for the area of the slice that occurs at x = **n**.



e) Find the volume of the figure.

3. a) Find the area between the curves $y = x^2 - 6x + 11$ and $y = 2x - 1$.

b) Find the volume created when that shape is rotated around the x-axis.

c) Find the volume when that shape is rotated around the y- axis.