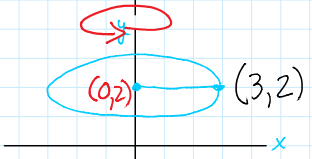


1. Take the line segment drawn to the left and rotate it around the x-axis.
 a. what shape will be created by the rotation?
 b. what is the area of the shape?

$$r = 3$$

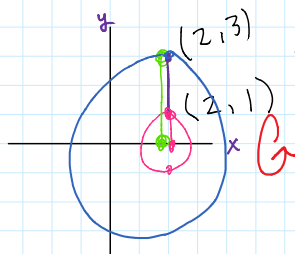
$$A = \pi(3)^2 = 9\pi$$



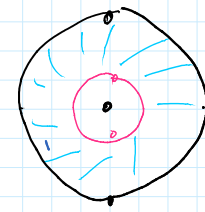
2. Take the line segment to the left and rotate it around the y-axis.
 a. what shape?
 b. area of the shape?

$$r = 3$$

$$A = 9\pi$$



3. Rotate the line segment to the left around the x-axis.
 a. what shape?
 b. Area of the shape?

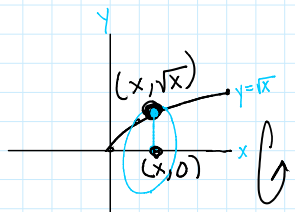


$$A_B - A_S$$

$$R_B = 3 \quad r_S = 1$$

$$\pi R^2 - \pi r^2$$

$$\pi(R^2 - r^2)$$



4. After rotating the line segment to the left around the x-axis, determine the general equation of the area of the shape formed by rotating the segment.

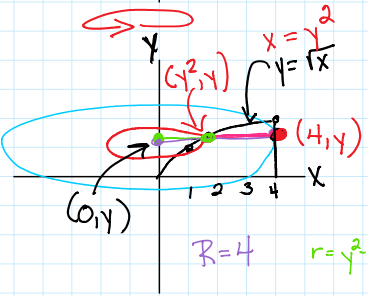
$$r = \sqrt{x} - 0$$

$$= \sqrt{x}$$

$$A = \pi(\sqrt{x})^2$$

$$= x\pi$$

$$9\pi - \pi = 8\pi$$



challenge:

5. Rotate the pink line segment around the y-axis and determine the general equation of the area of the shape formed.
 (Hint: think about if you would integrate w respect to x or y).

$$A = \pi R^2 - \pi r^2$$

$$= \pi(4)^2 - \pi(y^2)^2 = 16\pi - y^4\pi$$