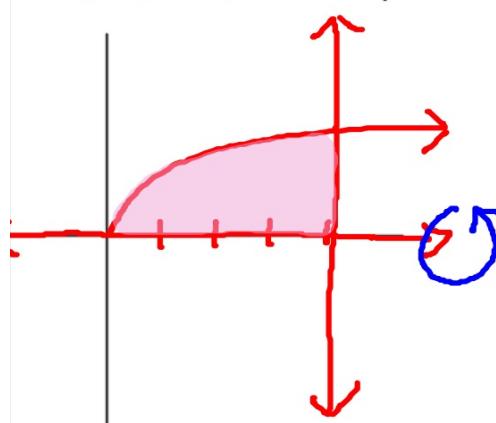


Given the graphs, shade the bounded region, draw the rotation, set up the integral to find volume, integrate, and calculate the volume.

$$y = \sqrt{x}, \quad x = 4, \quad \text{and} \quad y = 0$$

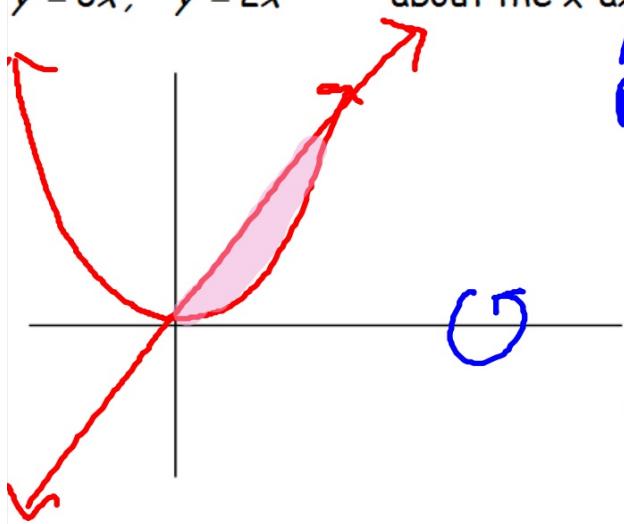


about the x-axis
Area: ~~TB or RL~~
Rotate: ~~TB~~

$$\begin{aligned} & \int_0^4 \pi((\sqrt{x})^2 - (0)^2) dx \\ & \int_0^4 \pi(x) dx \Big|_0^4 = \pi(f(4) - f(0)) \Big|_0^4 \\ & \pi\left(\frac{1}{2}x^2\right) \Big|_0^4 \\ & \pi\left(\frac{1}{2} \cdot 4^2 - \frac{1}{2} \cdot 0^2\right) = 8 \cdot \pi = 25.133 \end{aligned}$$

$$y = 3x, \quad y = 2x^2$$

about the x-axis



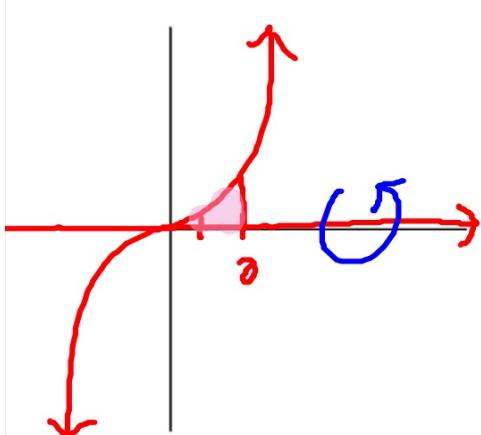
Area: TB
Rotate: TB

$$\begin{aligned}3x &= 2x^2 \\2x^2 - 3x &= 0 \\x(2x - 3) &= 0\end{aligned}$$

$$\begin{aligned}\int_0^{1.5} \pi ((3x)^3 - (2x^2)^2) dx \\ \int_0^{1.5} \pi (9x^3 - 4x^4) dx \\ \left. \pi \left(3x^3 - \frac{4}{5}x^5 \right) \right|_0^{1.5}\end{aligned}$$

$$12.723$$

$y = x^3$, $y = 0$, and $x = 2$ about the x -axis



Area: TB

Rotate: TB

$$\int_0^2 \pi((x^3)^2 - (0)^2) dx$$

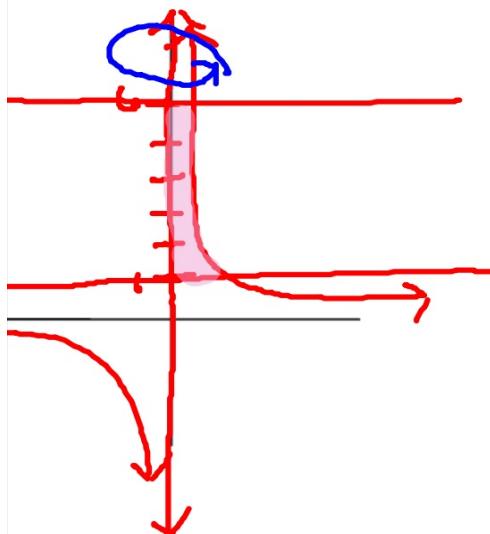
$$\int_0^2 \pi(x^6) dx$$

$$\pi\left(\frac{1}{7}x^7\right) \Big|_0^2$$

$$57.446$$

$$x = \frac{2}{y}, \quad y = 1, \quad y = 6, \quad \text{and} \quad x = 0$$

about the y-axis

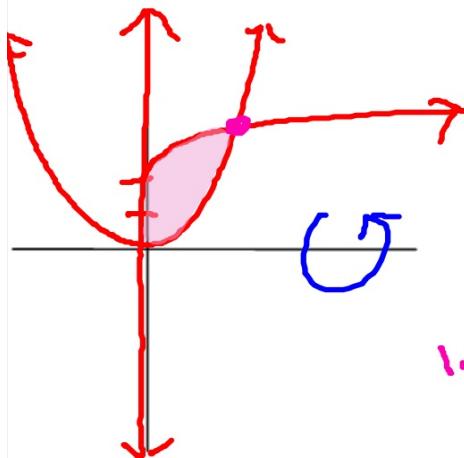


Area: RL
Rotate: RL

$$\begin{aligned}x &= \frac{2}{y} \\xy &= 2 \\y &= \frac{2}{x}\end{aligned}$$

$$\begin{aligned}&\int_1^6 \pi \left(\left(\frac{2}{y}\right)^2 - (0)^2 \right) dy \\&\int_1^6 \pi \left(\frac{4}{y^2} \right) dy = \int_1^6 \pi (4y^{-2}) dy \\&\pi (-4y^{-1}) \Big|_1^6 \\&\boxed{10.472}\end{aligned}$$

) $y = x^2$, and $y = \sqrt{x} + 2$, and $x = 0$ about the x-axis

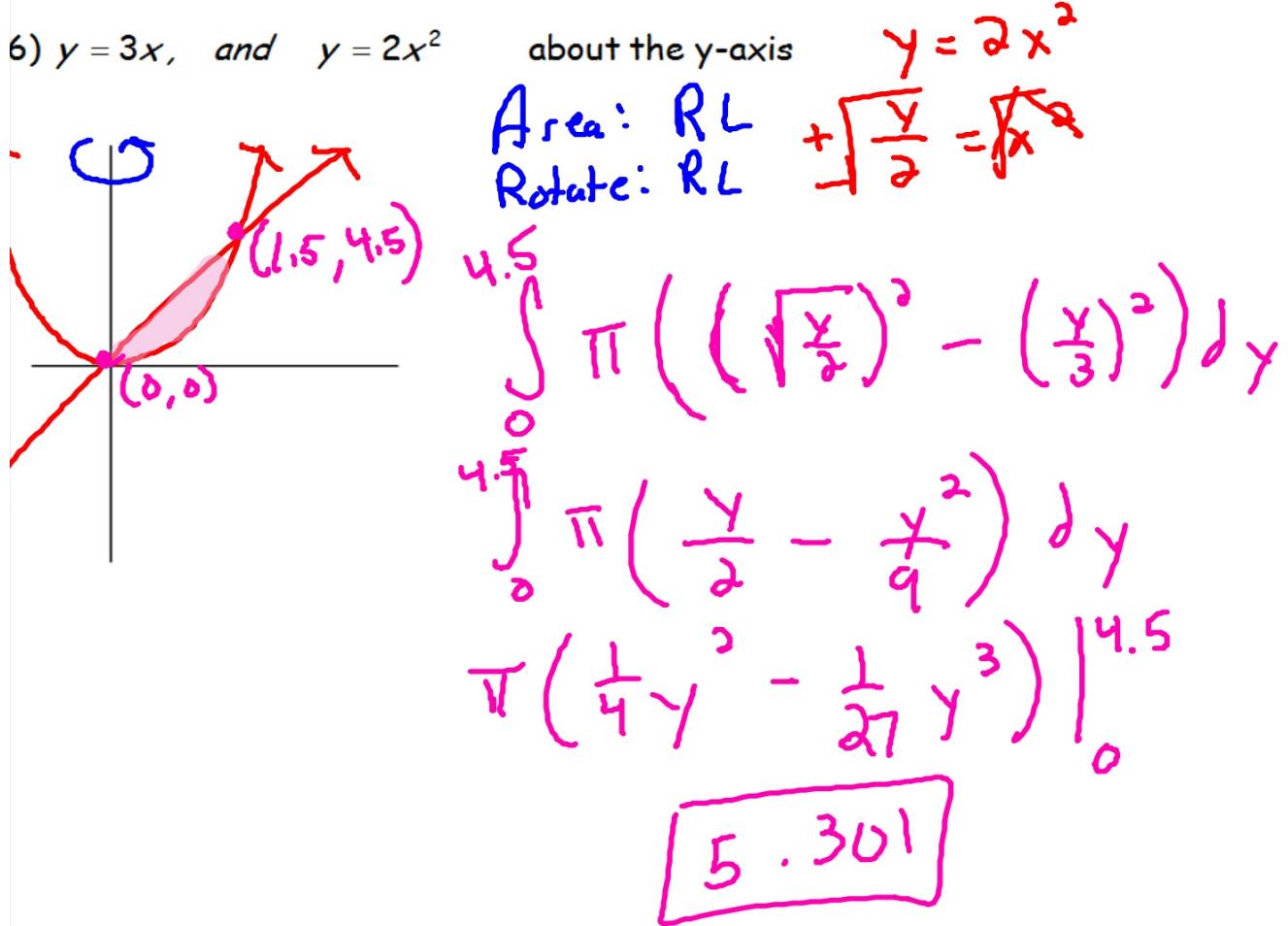


Arc curv. TB

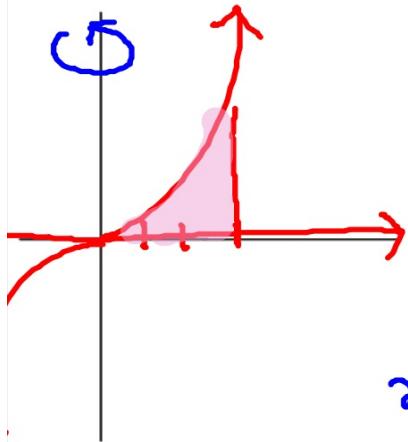
Rotate: TB

$$\int_0^{1.831} \pi \left((\sqrt{x} + 2)^2 - (x^2)^2 \right) dx$$
$$\int_0^{1.831} \pi \left(x + 4\sqrt{x} + 4 - x^4 \right) dx$$
$$\left. \pi \left(\frac{1}{2}x^2 + \frac{8}{3}x^{3/2} + 4x - \frac{1}{5}x^5 \right) \right|_0^{1.831}$$

36.101



1) $y = x^3$, $y = 0$, and $x = 3$ about the y-axis



Area: TB or RL
Rotate: RL

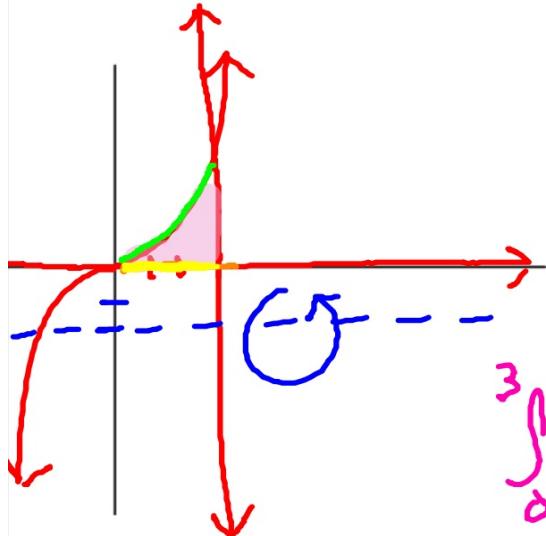
$$\int_0^3 \pi \left((3)^2 - (\sqrt[3]{y})^2 \right) dy$$

$$\int_0^3 \pi \left(9 - y^{2/3} \right) dy$$

$$\pi \left(9y - \frac{3}{5} y^{5/3} \right) \Big|_0^3$$

$$305.363$$

) $y = x^3$, $y = 0$, and $x = 3$ about the line $y = -2$



Area: TB

Rotate: TB

$$\int_0^3 \pi \left((x^3 + 2)^2 - (0 - 2)^2 \right) dx$$
$$\int_0^3 \pi (x^6 + 4x^3 + 4 - 4) dx$$
$$\int_0^3 \pi (x^6 + 4x^3) dx$$
$$\pi \left(\frac{1}{7}x^7 + x^4 \right) \Big|_0^3$$

235.942