

Volume Disc - about Axes!

Date _____ Period _____

For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the the x -axis.

1) $y = \csc x, y = 0, x = \frac{\pi}{2}, x = \frac{3\pi}{4}$

2) $y = \sqrt[3]{x}, y = 0, x = 1$

3) $y = \sqrt{x}, y = 0, x = 1$

4) $y = \sqrt{x}, y = 0, x = 4$

5) $y = x^2, y = 0, x = 2$

For each problem, find the volume of the solid that results when the region enclosed by the curves is revolved about the the y -axis.

6) $x = \sqrt{y}, x = 0, y = 1$

7) $x = -y^2 + 4, x = 0$

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

9) $x = y^3$, $x = 0$, $y = 1$

10) $x = y^2$, $x = 0$, $y = 2$

Answers to Volume Disc - about Axes! (ID: 1)

$$\begin{aligned} 1) \pi \int_{\frac{\pi}{2}}^{\frac{3\pi}{4}} \csc^2 x \, dx \\ = \pi \approx 3.142 \end{aligned}$$

$$\begin{aligned} 2) \pi \int_0^1 (\sqrt[3]{x})^2 \, dx \\ = \frac{3}{5}\pi \approx 1.885 \end{aligned}$$

$$\begin{aligned} 3) \pi \int_0^1 (\sqrt{x})^2 \, dx \\ = \frac{1}{2}\pi \approx 1.571 \end{aligned}$$

$$\begin{aligned} 4) \pi \int_0^4 (\sqrt{x})^2 \, dx \\ = 8\pi \approx 25.133 \end{aligned}$$

$$\begin{aligned} 5) \pi \int_0^2 (x^2)^2 \, dx \\ = \frac{32}{5}\pi \approx 20.106 \end{aligned}$$

$$\begin{aligned} 6) \pi \int_0^1 (\sqrt{y})^2 \, dy \\ = \frac{1}{2}\pi \approx 1.571 \end{aligned}$$

$$\begin{aligned} 7) \pi \int_{-2}^2 (-y^2 + 4)^2 \, dy \\ = \frac{512}{15}\pi \approx 107.233 \end{aligned}$$

$$\begin{aligned} 8) \pi \int_0^1 (y^2 + 2)^2 \, dy \\ = \frac{83}{15}\pi \approx 17.383 \end{aligned}$$

$$\begin{aligned} 9) \pi \int_0^1 (y^3)^2 \, dy \\ = \frac{1}{7}\pi \approx 0.449 \end{aligned}$$

$$\begin{aligned} 10) \pi \int_0^2 (y^2)^2 \, dy \\ = \frac{32}{5}\pi \approx 20.106 \end{aligned}$$