8.10 / Practice workbook

Volume with Disc Method: Revolving Around Other Axes

Practice

Problems 1–6 / Show your reasoning

1 The region between $y = 2x^2$ and $y = 2$ is revolved around the line $y = 2$. Find the volume.

2 The region bounded by $y = x$, $y = 2$, and the y-axis is revolved around the line $y = 2$. What is the volume?

A. $\frac{8\pi}{3}$

B. $\frac{4\pi}{3}$

C. $\frac{16\pi}{3}$

D. 2π

3 The region between $x = y^2$ and $x = 1$ is revolved around the line $x = 1$. Find the volume.

4 The region bounded by $y = \sqrt{x}$, the x-axis, and $x = 4$ is revolved around the line $x = 4$. Find the volume.

8.10 / AP-style free response

Problem 5 ➤ */ Show the work and the reasons a grader looks for.*

R is the region bounded by $y = x^3$, $y = 8$, and the y-axis. R is revolved around the line $y = 8$.

(a) Write, but do not evaluate, an integral expression for the volume of the solid.

(b) Find the volume of the solid.

6 The region bounded by $y = \frac{1}{x}$, $y = 1$, and $x = 4$ is revolved around the line $y = 1$. Find the volume.

8.10 / Answer key

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1 $\frac{64\pi}{15}$

2 (A)

3 $\frac{16\pi}{15}$

4 $\frac{256\pi}{15}$

5 (a) $\pi \int_0^2 (8 - x^3)^2 \, dx$; (b) $\frac{576\pi}{7}$

6 $\pi\left(\frac{15}{4} - 4\ln 2\right)$