8.7 / Practice workbook

Volumes with Cross Sections: Squares and Rectangles

Practice

Problems 1–6 / Show your reasoning

1 The base of a solid is the region under $y = \sqrt{x}$ for $0 \le x \le 4$. Cross sections perpendicular to the x-axis are squares. Find the volume.

2 The base is the region under $y = 2x$ for $0 \le x \le 1$. Cross sections perpendicular to the x-axis are squares. What is the volume?

A. $\frac{4}{3}$
B. 1
C. $\frac{2}{3}$
D. 4

3 The base is the region between $y = 4 - x^2$ and the x-axis. Cross sections perpendicular to the x-axis are rectangles of height 2. Find the volume.

4 The base is the region under $y = \frac{1}{x}$ for $1 \le x \le 3$. Cross sections perpendicular to the x-axis are squares. Find the volume.

8.7 / AP-style free response

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

The base of a solid is the region R between $y = 3x$ and $y = x^2$.

(a) Cross sections perpendicular to the x-axis are squares. Find the volume of the solid.

(b) Cross sections perpendicular to the x-axis are rectangles whose height is half the side in the base. Find the volume of the solid.

6 The base of a solid is the disk $x^2 + y^2 \leq 4$. Cross sections perpendicular to the x-axis are squares. Find the volume.

8.7 / Answer key

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1 8

2 (A)

3 $\frac{64}{3}$

4 $\frac{2}{3}$

5 (a) $\frac{81}{10}$; (b) $\frac{81}{20}$

6 $\frac{128}{3}$