8.5 / Practice workbook

Finding the Area Between Curves Expressed as Functions of y

Practice

Problems 1–6 / Show your reasoning

1 Find the area of the region between $x = y^2$ and $x = 4$.

2 Which integral gives the area of the region between $x = y^2$ and $x = y$?

A. $\int_0^1 (y - y^2)\,dy$

B. $\int_0^1 (y^2 - y)\,dy$

C. $\int_0^1 (y - y^2)\,dx$

D. $\int_{-1}^1 (y - y^2)\,dy$

3 Find the area of the region between $x = 2y^2$ and $x = y + 1$.

4 Find the area of the region bounded by $y = \ln x$, the y-axis, $y = 0$, and $y = 1$.

8.5 / AP-style free response

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

R is the region bounded by $y = \sqrt{x}$, $y = 6 - x$, and the x-axis.

(a) Find the area of R using horizontal strips.

(b) Write the area of R using vertical strips, and check that it agrees with part (a).

6 Find the area of the region between $x = y^3$ and $x = 4y$ for $y \geq 0$.

8.5 / Answer key

Finding the Area Between Curves Expressed as Functions of y

1 $\frac{32}{3}$

2 (A)

3 $\frac{9}{8}$

4 $e - 1$

5 (a) $\int_0^2 \left((6 - y) - y^2\right) dy = \frac{22}{3}$; (b) $\int_0^4 \sqrt{x}\, dx + \int_4^6 (6 - x)\, dx = \frac{16}{3} + 2 = \frac{22}{3}$

6 4