8.4 / Practice workbook

Finding the Area Between Curves Expressed as Functions of x

Practice

Problems 1–6 / Show your reasoning

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

2 Which integral gives the area of the region between $y = e^x$ and $y = 1$ for $0 \le x \le 2$?

A. $\int_0^2 (e^x - 1)\,dx$

B. $\int_0^2 (1 - e^x)\,dx$

C. $\int_0^2 e^x\,dx$

D. $\int_1^2 (e^x - 1)\,dx$

3 Find the area of the region between $y = x$ and $y = x^3$ for $0 \le x \le 1$.

4 Find the area of the region bounded by $y = x$, $y = \frac{1}{x}$, and $x = 3$.

8.4 / AP-style free response

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

R is the region between $y = 4 - x^2$ and $y = x + 2$.

(a) Find the area of R.

(b) Write an integral for the area of the part of R to the left of $x = -1$. Then find its value.

6 For $a > 0$, the region between $y = x^2$ and $y = ax$ has area 36. Find a.

8.4 / Answer key

Finding the Area Between Curves Expressed as Functions of x

1 $\frac{32}{3}$
2 (A)
3 $\frac{1}{4}$
4 $4 - \ln 3$
5 (a) $\frac{9}{2}$; (b) $\int_{-2}^{-1}(2 - x - x^2)\,dx = \frac{7}{6}$
6 $a = 6$