

Area between Two Curves

To calculate the area between two continuous curves, we have the following theorem.

Area between Two Curves Theorem: Let f and g be continuous functions such that $f(x) \geq g(x)$ on the interval $[a,b]$. Then, the area of the region bounded above by $f(x)$ and below by $g(x)$ on $[a,b]$ is given by

$$\int_a^b [f(x) - g(x)] dx.$$

Practice Problems

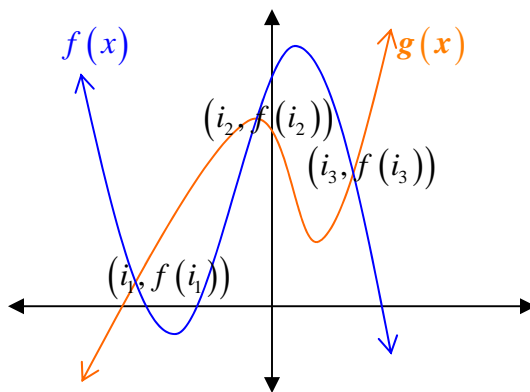
- 1st ed. problem set: Section 6.1 #1, #2, #5, #6, #7, #9, #10, #15, #16
 2nd ed. problem set: Section 6.1 #1, #2, #5–11 all, #16
 3rd ed. problem set: Section 6.1 #1, #2, #5–10 all, #16

Possible Exam Problems

#1 Calculate the area bounded by $y_1 = 2x - 1$ and $y_2 = x^2 - 4$

Answer: $\int_{-1}^3 (-x^2 + 2x + 3) dx = \frac{32}{3} \text{ sq. units}$

#2 Given that f and g intersect at $x = i_1$, $x = i_2$, and $x = i_3$, construct an integral that gives the area bounded by f and g below.



Answer: $\int_{i_1}^{i_2} [g(x) - f(x)] dx + \int_{i_2}^{i_3} [f(x) - g(x)] dx$