

Section 5.3: Evaluating Definite Integrals

These notes reflect material from our text, *Calculus, Concepts and Contexts, Second Edition*, by James Stewart, published by Brooks/Cole, Pacific Grove, CA, 2001.

*Key points from Stewart, Section 5.3: Evaluating definite integrals.
The definite integral of a derivative represents total change.*

Concepts

Evaluation Theorem. *If f is continuous on the interval $[a, b]$, and $F' = f$, then*

$$\int_a^b f(x) dx = F(b) - F(a).$$

Proof of the Evaluation Theorem from the Mean Value Theorem.

Indefinite integrals.

Total Change Theorem. *The integral of a rate of change is the total change,*

$$\int_a^b F'(x) dx = F(b) - F(a).$$

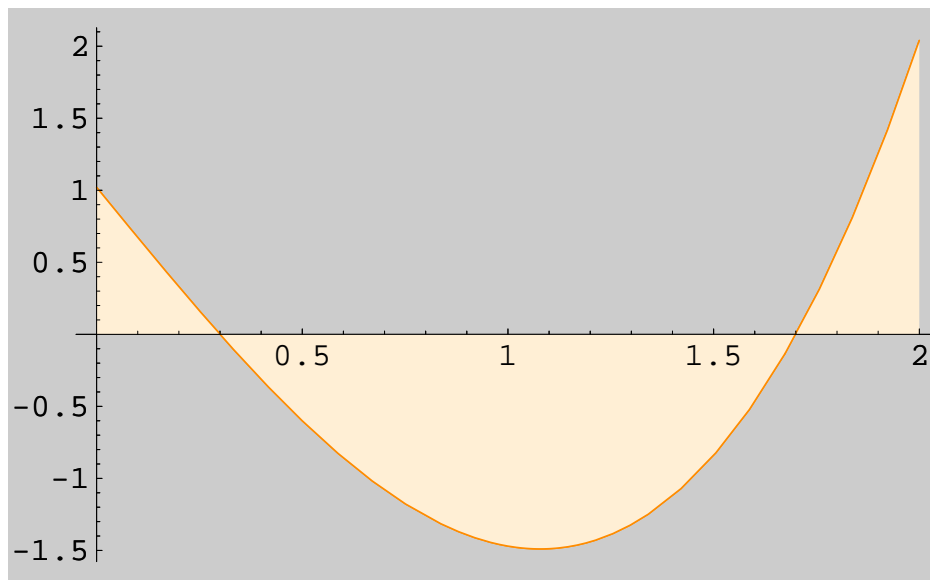


Fig. Signed area.

Exercises

Exercises for Section 5.3, pp 377–379: 1, 2, 4, 6, 12, 15, 18, 23, 28, 30, 31, 40, 49, 54, 57, 60