(e) Use a graphing utility to evaluate $\int_0^9 N(t)\,dt$, and use the result to estimate the number of customers entering the store between noon and 9 P.M. Compare this with your answer in part (b).

(f) Estimate the average number of customers entering the store per minute between 3 P.M. and 7 P.M.

In Exercises 59–62, find F as a function of x and evaluate F at $x = 2$, $x = 5$, and $x = 8$.

59. $F(x) = \int_0^x (t - 5)\,dt$ **60.** $F(x) = \int_2^x (t^3 + 2t - 2)\,dt$

61. $F(x) = \int_1^x \frac{10}{v^2}\,dv$ **62.** $F(x) = \int_1^x \left(y - \sqrt{y}\right)dy$

63. Let $g(x) = \int_0^x f(t)\,dt$, where f is a function whose graph is shown.

(a) Evaluate $g(0)$, $g(2)$, $g(4)$, $g(6)$, and $g(8)$.

(b) Find the largest open interval on which g is increasing. Find the largest open interval on which g is decreasing.

(c) Identify any extrema of g.

(d) Sketch a rough graph of g.

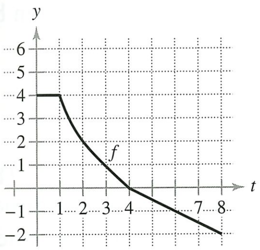


Figure for 63

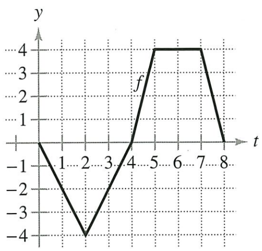


Figure for 64

64. Let $g(x) = \int_0^x f(t)\,dt$, where f is a function whose graph is shown.

(a) Evaluate $g(0)$, $g(2)$, $g(4)$, $g(6)$, and $g(8)$.

(b) Find the largest open interval on which g is increasing. Find the largest open interval on which g is decreasing.

(c) Identify any extrema of g.

(d) Sketch a rough graph of g.

In Exercises 65–70, (a) integrate to find F as a function of x and (b) demonstrate the Second Fundamental Theorem of Calculus by differentiating the result in part (a).

65. $F(x) = \int_0^x (t + 2)\,dt$ **66.** $F(x) = \int_0^x t(t^2 + 1)\,dt$

67. $F(x) = \int_8^x \sqrt[3]{t}\,dt$ **68.** $F(x) = \int_4^x \sqrt{t}\,dt$

69. $F(x) = \int_1^x \frac{1}{t^2}\,dt$ **70.** $F(x) = \int_0^x t^{3/2}\,dt$

In Exercises 71–74, use the Second Fundamental Theorem of Calculus to find $F'(x)$.

71. $F(x) = \int_{-2}^x (t^2 - 2t)\,dt$ **72.** $F(x) = \int_1^x \sqrt[4]{t}\,dt$

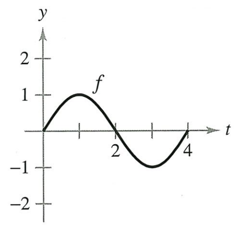
73. $F(x) = \int_{-1}^x \sqrt{t^4 + 1}\,dt$ **74.** $F(x) = \int_1^x \frac{t^2}{t^2 + 1}\,dt$

In Exercises 75–78, find $F'(x)$.

75. $F(x) = \int_x^{x+2} (4t + 1)\,dt$ **76.** $F(x) = \int_{-x}^x t^3\,dt$

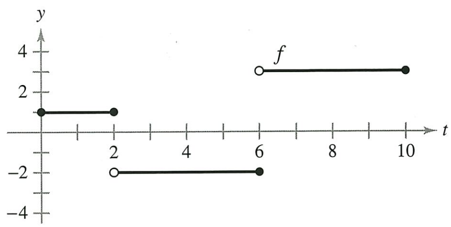
77. $F(x) = \int_2^{x^2} \frac{1}{t^3}\,dt$ **78.** $F(x) = \int_0^{3x} \sqrt{1 + t^3}\,dt$

79. ***Graphical Analysis*** Approximate the graph of g on the interval $0 \le x \le 4$, where $g(x) = \int_0^x f(t)\,dt$. Identify the x-coordinate of an extremum of g. To print an enlarged copy of the graph, go to the website *www.mathgraphs.com.*



80. Use the function f in the figure below and the function g defined by

$$g(x) = \int_0^x f(t)\,dt.$$



(a) Complete the table.

t	1	2	3	4	5	6	7	8	9	10
$g(x)$										

(b) Plot the points from the table in part (a).

(c) Where does g have its minimum? Explain.

(d) Where does g have a maximum? Explain.

(e) Between which two consecutive points does g increase at the greatest rate? Explain.

(f) Identify the zeros of g.