

33.  $\int (x^{5/2} + 2x^{3/2} - x) dx$  34.  $\int (t^{3/2} + 2t^{1/2} - 4t^{-1/2}) dt$

35.  $\int \left( \sqrt{x} + \frac{2}{\sqrt{x}} \right) dx$  36.  $\int \left( \sqrt[3]{x^2} - \frac{1}{x^2} \right) dx$

37.  $\int \left( \frac{u^3 + 2u^2 - u}{3u} \right) du$

Hint:  $\frac{u^3 + 2u^2 - u}{3u} = \frac{1}{3}u^2 + \frac{2}{3}u - \frac{1}{3}$

38.  $\int \frac{x^4 - 1}{x^2} dx$

Hint:  $\frac{x^4 - 1}{x^2} = x^2 - x^{-2}$

39.  $\int (2t + 1)(t - 2) dt$  40.  $\int u^{-2}(1 - u^2 + u^4) du$

41.  $\int \frac{1}{x^2} (x^4 - 2x^2 + 1) dx$  42.  $\int \sqrt{t} (t^2 + t - 1) dt$

43.  $\int \frac{ds}{(s + 1)^{-2}}$  44.  $\int \left( \sqrt{x} + \frac{3}{x} - 2e^x \right) dx$

45.  $\int (e^t + t^e) dt$  46.  $\int \left( \frac{1}{x^2} - \frac{1}{\sqrt[3]{x^2}} + \frac{1}{\sqrt{x}} \right) dx$

47.  $\int \frac{x^3 + x^2 - x + 1}{x^2} dx$

Hint: Simplify the integrand first.

48.  $\int \frac{t^3 + \sqrt[3]{t}}{t^2} dt$

Hint: Simplify the integrand first.

49.  $\int \frac{(\sqrt{x} - 1)^2}{x^2} dx$

Hint: Simplify the integrand first.

50.  $\int (x + 1)^2 \left( 1 - \frac{1}{x} \right) dx$

Hint: Simplify the integrand first.

In Exercises 51–58, find  $f(x)$  by solving the initial-value problem.

51.  $f'(x) = 3x + 1; f(1) = 3$

52.  $f'(x) = 3x^2 - 6x; f(2) = 4$

53.  $f'(x) = 3x^2 + 4x - 1; f(2) = 9$

54.  $f'(x) = \frac{1}{\sqrt{x}}; f(4) = 2$

55.  $f'(x) = 1 + \frac{1}{x^2}; f(1) = 3$

56.  $f'(x) = e^x - 2x; f(0) = 2$

57.  $f'(x) = \frac{x + 1}{x}; f(1) = 1$

58.  $f'(x) = 1 + e^x + \frac{1}{x}; f(1) = 3 + e$

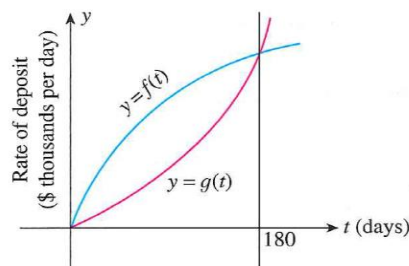
In Exercises 59–62, find the function  $f$  given that the slope of the tangent line to the graph of  $f$  at any point  $(x, f(x))$  is  $f'(x)$  and that the graph of  $f$  passes through the given point.

59.  $f'(x) = \frac{1}{2}x^{-1/2}; (2, \sqrt{2})$

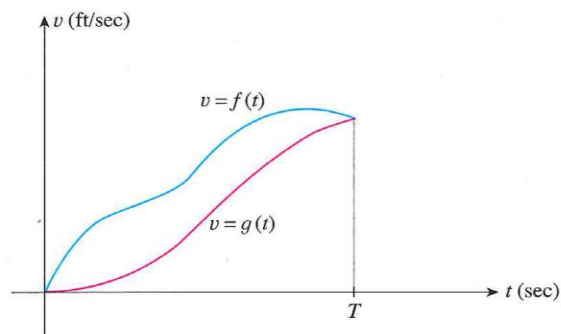
60.  $f'(t) = t^2 - 2t + 3; (1, 2)$

61.  $f'(x) = e^x + x; (0, 3)$  62.  $f'(x) = \frac{2}{x} + 1; (1, 2)$

**63. BANK DEPOSITS** Madison Finance opened two branches on September 1 ( $t = 0$ ). Branch A is located in an established industrial park, and Branch B is located in a fast-growing new development. The net rate at which money was deposited into Branch A and Branch B in the first 180 business days is given by the graphs of  $f$  and  $g$ , respectively (see the figure). Which branch has the larger amount on deposit at the end of 180 business days? Justify your answer.



**64. VELOCITY OF A CAR** Two cars, side by side, start from rest and travel along a straight road. The velocity of Car A is given by  $v = f(t)$ , and the velocity of Car B is given by  $v = g(t)$ . The graphs of  $f$  and  $g$  are shown in the figure below. Are the cars still side by side after  $T$  sec? If not, which car is ahead of the other? Justify your answer.



**65. U.S. SMARTPHONE USERS** The number of smartphone users and penetration in the United States continues to grow steadily. The number of users (in millions) from 2011 through 2015 is projected to grow at the rate of

$$R(t) = 14.3 \quad (0 \leq t \leq 4)$$

million/year. The number of users in 2011 ( $t = 0$ ) was 90.1 million. Find an expression giving the projected number of smartphone users in year  $t$ . What is the estimated number of smartphone users in 2015?

Source: eMarketer.