

Problems for Section 7.1

In Problems 1–26, find an antiderivative.

1. $f(x) = 5$

3. $g(t) = t^2 + t$

5. $f(x) = x^4$

7. $g(x) = 6x^3 + 4$

9. $h(y) = 3y^2 - y^3$

11. $f(x) = 3x^2 + 5$

13. $p(x) = x^2 - 6x + 17$

15. $f(x) = 5x - \sqrt{x}$

17. $h(z) = \frac{1}{z}$

19. $g(z) = \frac{1}{z^3}$

21. $f(x) = x^6 - \frac{1}{7x^6}$

23. $g(t) = e^{-3t}$

25. $g(t) = 5 + \cos t$

In Problems 27–32, find an antiderivative $F(x)$ with $F'(x) = f(x)$ and $F(0) = 0$. Is there only one possible solution?

27. $f(x) = 3$

29. $f(x) = 2 + 4x + 5x^2$

31. $f(x) = \sqrt{x}$

Find the indefinite integrals in Problems 33–62.

33. $\int (5x + 7) dx$

35. $\int 6x^2 dx$

37. $\int (x + 1)^2 dx$

39. $\int (t^2 + 5t + 1) dt$

41. $\int (t^3 + 6t^2) dt$

43. $\int 3\sqrt{w} dw$

45. $\int \left(\frac{3}{t} - \frac{2}{t^2} \right) dt$

47. $\int \left(x + \frac{1}{\sqrt{x}} \right) dx$

49. $\int (e^x + 5) dx$

51. $\int e^{3r} dr$

53. $\int \sin t dt$

55. $\int 100e^{4x} dx$

57. $\int (3 \cos x - 7 \sin x) dx$

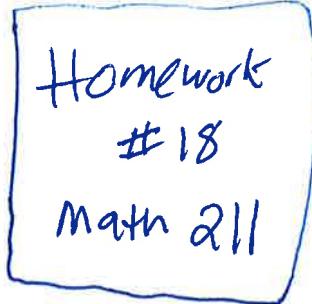
For Problems 63–66, find an antiderivative $F(x)$ with $F'(x) = f(x)$ and $F(0) = 5$.

63. $f(x) = 6x - 5$

65. $f(x) = 8 \sin(2x)$

For Problems 63–66, find an antiderivative $F(x)$ with $F'(x) = f(x)$ and $F(0) = 5$.

67. A firm's marginal cost function is $MC = 3q^2 + 4q + 6$.
Find the total cost function if the fixed costs are 200.



Solutions

Section 7.1

- 1 $5x$
- 3 $t^3/3 + t^2/2$
- 5 $x^5/5$
- 7 $3x^4/2 + 4x$
- 9 $y^3 - y^4/4$
- 11 $x^3 + 5x$
- 13 $(x^3/3) - 3x^2 + 17x$
- 15 $5x^2/2 - 2x^{3/2}/3$
- 17 $\ln|z|$
- 19 $-1/2z^2$
- 21 $F(x) = x^7/7 + x^{-5}/35 + C$
- 23 $-e^{-3t}/3$
- 25 $G(t) = 5t + \sin t + C$
- 27 $F(x) = 3x$
(only possibility)
- 29 $F(x) = 2x + 2x^2 + (5/3)x^3$
(only possibility)
- 31 $F(x) = (2/3)x^{3/2}$
(only possibility)
- 33 $(5/2)x^2 + \frac{7}{3}x + C$
- 35 $2x^3 + C$
- 37 $(x+1)^3/3 + C$
- 39 $t^3/3 + 5t^2/2 + t + C$
- 41 $t^4/4 + 2t^3 + C$
- 43 $2w^{3/2} + C$
- 45 $3\ln|t| + \frac{2}{t} + C$
- 47 $x^2/2 + 2x^{1/2} + C$
- 49 $e^x + 5x + C$
- 51 $e^{3r}/3 + C$
- 53 $-\cos t + C$
- 55 $25e^{4x} + C$
- 57 $3\sin x + 7\cos x + C$
- 59 $\frac{1}{2}\sin(x^2 + 4) + C$
- 61 $10x - 4\cos(2x) + C$
- 63 $F(x) = 3x^2 - 5x + 5$
- 65 $F(x) = -4\cos(2x) + 9$
- 67 $q^3 + 2q^2 + 6q + 200$