(c) We have

$$\begin{aligned}\sqrt{9x^5} &= 10\\ 3x^{5/2} &= 10\\ x^{5/2} &= \frac{10}{3}\\ x &= \left(\frac{10}{3}\right)^{2/5} = 1.619.\end{aligned}$$

Exercises to Skills for Chapter 4

For Exercises 1–33, evaluate without a calculator.

1. $(-5)^2$ **2.** 11^2 **3.** 10^4

4. $(-1)^{13}$ **5.** $\dfrac{5^3}{5^2}$ **6.** $\dfrac{10^8}{10^5}$

7. $\dfrac{6^4}{6^4}$ **8.** $\sqrt{4}$ **9.** $\sqrt{4^2}$

10. $\sqrt{4^4}$ **11.** $\sqrt{(-4)^2}$ **12.** $\dfrac{1}{7^{-2}}$

13. $\dfrac{2^7}{2^3}$ **14.** $(-1)^{445}$ **15.** -11^2

16. $\left(5^0\right)^3$ **17.** $2.1\left(10^3\right)$ **18.** $16^{1/2}$

19. $16^{1/4}$ **20.** $16^{3/4}$ **21.** $16^{5/4}$

22. $16^{5/2}$ **23.** $100^{5/2}$ **24.** $\sqrt{(-4)^2}$

25. $(-1)^3\sqrt{36}$ **26.** $(0.04)^{1/2}$ **27.** $(-8)^{2/3}$

28. 3^{-1} **29.** $3^{-3/2}$ **30.** 25^{-1}

31. 25^{-2} **32.** $(1/27)^{-1/3}$ **33.** $(0.125)^{1/3}$

Simplify the expressions in Exercises 34–55 and leave without radicals if possible. Assume all variables are positive.

34. $\sqrt{x^4}$ **35.** $\sqrt{y^8}$

36. $\sqrt{w^8z^4}$ **37.** $\sqrt{x^5y^4}$

38. $\sqrt{49w^9}$ **39.** $\sqrt{25x^3z^4}$

40. $\sqrt{r^2}$ **41.** $\sqrt{r^3}$

42. $\sqrt{r^4}$ **43.** $\sqrt{64s^7}$

44. $\sqrt{50x^4y^6}$ **45.** $\sqrt{48u^{10}v^{12}y^5}$

46. $\sqrt{6s^2t^3v^5}\sqrt{6st^5v^3}$ **47.** $\left(S\sqrt{16xt^2}\right)^2$

48. $\sqrt{e^{2x}}$ **49.** $(3AB)^{-1}\left(A^2B^{-1}\right)^2$

50. $e^{kt}\cdot e^3\cdot e$ **51.** $\sqrt{M+2}(2+M)^{3/2}$

52. $\left(y^{-2}e^y\right)^2$ **53.** $\dfrac{a^{n+1}3^{n+1}}{a^n3^n}$

54. $\left(a^{-1}+b^{-1}\right)^{-1}$

55. $\left(\dfrac{35(2b+1)^9}{7(2b+1)^{-1}}\right)^2$ (Do not expand $(2b+1)^9$.)

If possible, evaluate the quantities in Exercises 56–64. Check your answers with a calculator.

56. $(-32)^{3/5}$ **57.** $-32^{3/5}$ **58.** $-625^{3/4}$

59. $(-625)^{3/4}$ **60.** $(-1728)^{4/3}$ **61.** $64^{-3/2}$

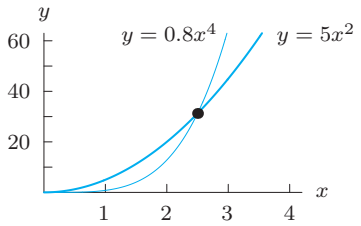
62. $-64^{3/2}$ **63.** $(-64)^{3/2}$ **64.** $81^{5/4}$

In Exercises 65–66, solve for x.

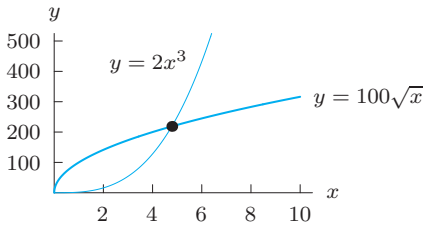
65. $7x^4 = 20x^2$ **66.** $2(x+2)^3 = 100$

In Exercises 67–68, use algebra to find the point of intersection.

67.



68.



Are the statements in Exercises 69–74 true or false?

69. $x^2y^5 = (xy)^{10}$

70. $5u^2 + 5u^3 = 10u^5$

71. $(3r)^2 9s^2 = 81r^2s^2$

72. $\sqrt[3]{-64b^3c^6} = -4bc^2$

73. $-4w^2 - 3w^3 = -w^2(4 + 3w)$

74. $(u + v)^{-1} = \dfrac{1}{u} + \dfrac{1}{v}$

Solve the equations in Exercises 75–76 in terms of r and s, given that

$$2^r = 5 \qquad \text{and} \qquad 2^s = 7.$$

75. $2^x = 35.$

76. $2^x = 140.$

Let $2^a = 5$ and $2^b = 7$. Using exponent rules, solve the equations in Exercises 77–82 in terms of a and b.

77. $5^x = 32$

78. $7^x = \dfrac{1}{8}$

79. $25^x = 64$

80. $14^x = 16$

81. $5^x = 7$

82. $0.4^x = 49$