

Find each root. Assume that all variables represent nonnegative real numbers. See Example 4.

29. $-\sqrt[4]{16}$ 30. $\sqrt[5]{-243}$
 31. $\sqrt[4]{-16}$ 32. $\sqrt{-16}$
 33. $\sqrt[5]{-32}$ 34. $\sqrt[5]{-1}$
 35. $\sqrt[5]{x^{20}}$ 36. $\sqrt[4]{x^{20}}$
 37. $\sqrt[6]{64x^{12}}$ 38. $\sqrt[5]{-32x^{15}}$
 39. $\sqrt{81x^4}$ 40. $\sqrt[4]{81x^4}$
 41. $\sqrt[4]{256x^8}$ 42. $\sqrt{256x^8}$

Simplify. Assume that the variables represent any real number. See Example 5.

43. $\sqrt{(-8)^2}$ 44. $\sqrt{(-7)^2}$
 45. $\sqrt[3]{(-8)^3}$ 46. $\sqrt[5]{(-7)^5}$
 47. $\sqrt{4x^2}$ 48. $\sqrt[4]{16x^4}$
 49. $\sqrt[3]{x^3}$ 50. $\sqrt[5]{x^5}$
 51. $\sqrt{(x-5)^2}$ 52. $\sqrt{(y-6)^2}$
 53. $\sqrt{x^2 + 4x + 4}$ 54. $\sqrt{x^2 - 8x + 16}$
 (Hint: Factor the polynomial first.) (Hint: Factor the polynomial first.)

MIXED PRACTICE

Simplify each radical. Assume that all variables represent positive real numbers.

55. $-\sqrt{121}$ 56. $-\sqrt[3]{125}$
 57. $\sqrt[3]{8x^3}$ 58. $\sqrt{16x^8}$
 59. $\sqrt{y^{12}}$ 60. $\sqrt[3]{y^{12}}$
 61. $\sqrt{25a^2b^{20}}$ 62. $\sqrt{9x^4y^6}$
 63. $\sqrt[3]{-27x^{12}y^9}$ 64. $\sqrt[3]{-8a^{21}b^6}$
 65. $\sqrt[4]{a^{16}b^4}$ 66. $\sqrt[4]{x^8y^{12}}$
 67. $\sqrt[5]{-32x^{10}y^5}$ 68. $\sqrt[5]{-243x^5z^{15}}$
 69. $\sqrt{\frac{25}{49}}$ 70. $\sqrt{\frac{4}{81}}$
 71. $\sqrt{\frac{x^{20}}{4y^2}}$ 72. $\sqrt{\frac{y^{10}}{9x^6}}$
 73. $-\sqrt[3]{\frac{z^{21}}{27x^3}}$ 74. $-\sqrt[3]{\frac{64a^3}{b^9}}$

75. $\sqrt[4]{\frac{x^4}{16}}$ 76. $\sqrt[4]{\frac{y^4}{81x^4}}$

If $f(x) = \sqrt{2x+3}$ and $g(x) = \sqrt[3]{x-8}$, find the following function values. See Example 6.

77. $f(0)$ 78. $g(0)$
 79. $g(7)$ 80. $f(-1)$
 81. $g(-19)$ 82. $f(3)$
 83. $f(2)$ 84. $g(1)$

Identify the domain and then graph each function. See Example 7.

85. $f(x) = \sqrt{x} + 2$ 86. $f(x) = \sqrt{x} - 2$
 87. $f(x) = \sqrt{x-3}$; use the following table.

x	$f(x)$
3	
4	
7	
12	

88. $f(x) = \sqrt{x+1}$; use the following table.

x	$f(x)$
-1	
0	
3	
8	

Identify the domain and then graph each function. See Example 8.

89. $f(x) = \sqrt[3]{x} + 1$
 90. $f(x) = \sqrt[3]{x} - 2$
 91. $g(x) = \sqrt[3]{x-1}$; use the following table.

x	$g(x)$
1	
2	
0	
9	
-7	

92. $g(x) = \sqrt[3]{x+1}$; use the following table.

x	$g(x)$
-1	
0	
-2	
7	
-9	