[06-12-19-L11-A]

Questions before #47 intentionally omitted.

5.2 Exercises

Write each of the following with radicals. Assume that all variables represent positive real numbers. See Example 3.

47. $12^{1/2}$ **48.** $3^{1/2}$ **49.** $9^{1/5}$ **50.** $8^{3/4}$

51. $(7y)^{2/3}$ **52.** $(9q)^{5/8}$ **53.** $(3py^2)^{1/4}$ **54.** $(6a^2b)^{2/3}$

55. $(2m)^{-3/2}$ **56.** $(5y)^{-3/5}$ **57.** $(2y + x)^{2/3}$ **58.** $(r + 2z)^{1/2}$

59. $(p^2 + q^2)^{1/2}$ **60.** $(b^3 + a^3)^{1/3}$ **61.** $(3m^4 + 2k^2)^{-2/3}$ **62.** $(5x^2 + 3z^3)^{-5/6}$

Write with rational exponents. Assume that all variables represent positive real numbers. See Example 4.

63. $\sqrt{13}$ **64.** $\sqrt{29}$ **65.** $\sqrt[3]{7}$ **66.** $\sqrt[3]{24}$

67. $\sqrt{2^3}$ **68.** $\sqrt{5^5}$ **69.** $\sqrt[3]{6^4}$ **70.** $\sqrt[4]{7^3}$

71. $-\sqrt[3]{8^5}$ **72.** $-\sqrt[5]{9^2}$ **73.** $\sqrt[4]{x^3}$ **74.** $\sqrt[5]{y^3}$

75. $\sqrt[7]{a^2}$ **76.** $\sqrt[4]{p^9}$ **77.** $\dfrac{\sqrt{x^5}}{x^4}$ **78.** $\dfrac{\sqrt[3]{k^5}}{\sqrt[3]{k^7}}$

79. $\sqrt[4]{x^3} \cdot \sqrt[4]{x^6}$ **80.** $\sqrt[5]{y^2} \cdot \sqrt[5]{y^9}$ **81.** $\sqrt{m + r}$ **82.** $\sqrt{7z + 2y}$

83. $\sqrt[4]{m^3 + r^3}$ **84.** $\sqrt[5]{k^2}$ **85.** $\sqrt[3]{m - 5n}$ **86.** $\sqrt[3]{8a - 3b}$

87. $\sqrt[3]{9m^2p}$ **88.** $\sqrt[4]{12a^3b^2c}$ **89.** $2\sqrt{m} - 5\sqrt[3]{m^2}$ **90.** $3\sqrt[3]{p^2} + 2\sqrt[5]{p^3}$

Use absolute value to simplify each of the following. Assume that all radicands represent positive real numbers.

91. $\sqrt{m^6}$ **92.** $\sqrt{r^{10}}$

93. $\sqrt{16z^2}$ **94.** $\sqrt{100p^2}$

95. $\sqrt{25r^4z^{10}}$ **96.** $\sqrt{64m^6n^8}$

97. $\sqrt{(r - 2q)^2}$ **98.** $\sqrt{(3a - 2b)^2}$

99. $\sqrt{m^2 - 2mq + q^2}$ **100.** $\sqrt{9z^2 - 24zx + 16x^2}$

101. $\dfrac{-5}{\sqrt{p^4 - 2p^2q^2 + q^4}}$ **102.** $\dfrac{3}{\sqrt{a^4 - 8a^3b + 16a^2b^2}}$

Write Exercises 103–108 with rational exponents. Assume all variables represent positive real numbers.

103. $\sqrt{y} \cdot \sqrt[3]{y}$ **104.** $\sqrt[3]{x}\sqrt{x}$ **105.** $\sqrt{\sqrt[3]{m}}$

106. $\sqrt[3]{\sqrt{k}}$ **107.** $\sqrt{\sqrt[3]{\sqrt[4]{x}}}$ **108.** $\sqrt[3]{\sqrt[5]{\sqrt{y}}}$

109. Show that $\dfrac{3 + \sqrt{3}}{3}$ is a solution of $3x^2 + 2 = 6x$.

110. Show that $\dfrac{-2 + 2\sqrt{11}}{5}$ is a solution of $5y^2 = 8 - 4y$.

Review Exercises *Simplify each of the following. See Sections 3.1 and 3.2.*

111. $p^8 \cdot p^{-2} \cdot p^5$ **112.** $y^3 \cdot y^{-7} \cdot y^{-9}$ **113.** $(6x^2)^{-1}(2x^3)^{-2}$

114. $(5m^{-1})^2(3m^{-2})^{-1}$ **115.** $(8r^2s)^{-1}(2r^{-1}s^{-2})^{-1}$ **116.** $(3p^{-1}q^{-2})^{-1}(2pq^{-1})^{-1}$

Section 5.2 (page 214)

1. 9 **3.** 4 **5.** -6 **7.** 3 **9.** -5 **11.** Not a real number **13.** -9 **15.** 2
17. 4 **19.** -2 **21.** 4 **23.** -2 **25.** m^5 **27.** q^3 **29.** 6 **31.** 3
33. 2.646 **35.** -4.359 **37.** -9.055 **39.** 12.247 **41.** -22.583 **43.** 29.833
45. 6 square meters **47.** $\sqrt{12}$ **49.** $\sqrt[5]{9}$ **51.** $\sqrt[3]{(7y)^2}$ or $\sqrt[3]{49y^2}$ **53.** $\sqrt[4]{3py^2}$
55. $1/\sqrt{(2m)^3}$ or $1/\sqrt{8m^3}$ **57.** $\sqrt[3]{(2y + x)^2}$ **59.** $\sqrt{p^2 + q^2}$ **61.** $1/\sqrt[3]{(3m^4 + 2k^2)^2}$
63. $13^{1/2}$ **65.** $7^{1/3}$ **67.** $2^{3/2}$ **69.** $6^{4/3}$ **71.** $-8^{5/3}$ **73.** $x^{3/4}$ **75.** $a^{2/7}$

77. $x^{-3/2}$ **79.** $x^{9/4}$ **81.** $(m + r)^{1/2}$ **83.** $(m^3 + r^3)^{1/4}$ **85.** $(m - 5n)^{1/3}$ **87.** $(9m^2p)^{1/3}$
89. $2m^{1/2} - 5m^{2/3}$ **91.** $|m^3|$ or $m^2|m|$ **93.** $4|z|$ **95.** $5r^2|z^5|$ or $5r^2z^4|z|$ **97.** $|r - 2q|$
99. $|m - q|$ **101.** $-5/|p^2 - q^2|$ **103.** $y^{5/6}$ **105.** $m^{1/6}$ **107.** $x^{1/24}$ **111.** p^{11}
113. $1/(24x^8)$ **115.** $s/(16r)$