71. $\sqrt{\frac{a^4b^6}{12c^2}}$ **72.** $\sqrt{\frac{48u^5v^2}{4uv^4}}$ **73.** $\sqrt{\frac{144k^8}{256}}$ **74.** $\sqrt{\frac{3600}{81m^{36}}}$ **75.** $\sqrt{\frac{225x^{40}}{16}}$

76. $\sqrt{x^2 + 8x + 16}$ **77.** $\sqrt{a^2 - 4a + 4}$ **78.** $\sqrt{81 + 18k + k^2}$

Solve. (11-5)

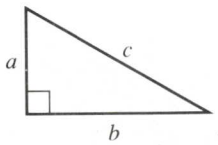
79. $g^2 = 49$ **80.** $h^2 - 64 = 0$ **81.** $25m^2 = 16$

82. $9x^2 - 4 = 0$ **83.** $6y^2 - 54 = 0$ **84.** $32t^2 - 27 = 0$

Find both roots of each equation to the nearest tenth. (11-5)

85. $a^2 = 132$ **86.** $b^2 - 208 = 0$ **87.** $11c^2 = 473$

In Exercises 88–95, refer to the right triangle shown at the right. Find the missing length correct to the nearest hundredth. (11-6)



88. $a = 3$, $b = 4$, $c =$?

89. $a = 5$, $b = 8$, $c =$?

90. $a =$?, $b = 9$, $c = 13$

91. $a =$?, $b = 10$, $c = 15$

92. $a = 8$, $b =$?, $c = 16$

93. $a = 20$, $b =$?, $c = 30$

94. $a = 12$, $b = \frac{3}{4}a$, $c =$?

95. $a = \frac{2}{3}b$, $b = 15$, $c =$?

State whether or not the three numbers given could represent the lengths of the sides of a right triangle. (11-6)

96. 21, 28, 35 **97.** 9, 9, 12 **98.** 45, 60, 75

99. 31, 41, 51 **100.** $6a$, $8a$, $10a$, $a > 0$ **101.** $5a$, $7a$, $9a$, $a > 0$

Simplify. (11-7)

102. $\sqrt{3} \cdot 4\sqrt{3}$ **103.** $2\sqrt{5} \cdot 3\sqrt{5}$ **104.** $\sqrt{7} \cdot \sqrt{6} \cdot \sqrt{2}$

105. $\sqrt{7} \cdot \sqrt{7} \cdot \sqrt{4}$ **106.** $5\sqrt{2} \cdot \sqrt{3}$ **107.** $8\sqrt{162}$

108. $\sqrt{\frac{5}{9}} \cdot \sqrt{\frac{9}{5}}$ **109.** $\sqrt{\frac{7}{5}} \cdot \sqrt{\frac{45}{14}}$ **110.** $\sqrt{5\frac{5}{6}} \cdot \sqrt{2\frac{4}{7}}$

111. $\frac{1}{4}\sqrt{\frac{16}{3}} \cdot \frac{1}{2}\sqrt{\frac{3}{2}}$ **112.** $\frac{12\sqrt{20}}{4\sqrt{3}}$ **113.** $\frac{11\sqrt{6}}{\sqrt{98}}$

Simplify. Assume all variables represent positive real numbers. (11-7)

114. $(3\sqrt{y})(-5\sqrt{x^2y})$ **115.** $\sqrt{n}(\sqrt{n^3} + 3)$ **116.** $(7\sqrt{3})(-4\sqrt{6})(5\sqrt{22})$

Simplify. (11-8)

117. $9\sqrt{3} - 5\sqrt{3}$ **118.** $7\sqrt{2} + 6\sqrt{2}$ **119.** $3\sqrt{54} - 2\sqrt{6}$

120. $4\sqrt{28} + 6\sqrt{112}$ **121.** $-10\sqrt{18} - 5\sqrt{32}$ **122.** $\sqrt{242} - 3\sqrt{363}$

Simplify. (11-8)

123. $\sqrt{8} - \sqrt{\frac{5}{6}}$ **124.** $\sqrt{\frac{2}{3}} - \sqrt{\frac{3}{2}}$ **125.** $5\sqrt{\frac{16}{7}} + \sqrt{\frac{9}{8}}$

126. $3\sqrt{63} + 2\sqrt{28} - \sqrt{35}$ **127.** $\sqrt{120} - \sqrt{270} + \sqrt{300}$

128. $2\sqrt{\frac{5}{3}} + 4\sqrt{\frac{3}{8}} - \frac{1}{2}\sqrt{68}$ **129.** $3\sqrt{5}(\sqrt{75} - 2\sqrt{12})$

Simplify. (11-9)

130. $(5 - \sqrt{3})(5 + \sqrt{3})$ **131.** $(\sqrt{7} + 6)(\sqrt{7} - 6)$

132. $(\sqrt{6} - \sqrt{5})(\sqrt{6} + \sqrt{5})$ **133.** $(4 + \sqrt{2})^2$

134. $(5 - \sqrt{5})^2$ **135.** $(3\sqrt{2} - 4)^2$

136. $(\sqrt{11} + 3\sqrt{7})^2$ **137.** $2\sqrt{6}(5\sqrt{2} - 4\sqrt{3})$

138. $(4\sqrt{5} - 6)(2\sqrt{7} + 7)$ **139.** $(3\sqrt{14} + 2\sqrt{7})(5\sqrt{14} + 3\sqrt{7})$

Rationalize the denominator of each fraction. (11-9)

140. $\frac{5}{3 + \sqrt{7}}$ **141.** $\frac{2 + \sqrt{3}}{1 - \sqrt{5}}$

Solve. (11-10)

142. $\sqrt{m} = 7$ **143.** $\sqrt{6x} = \frac{3}{2}$ **144.** $\sqrt{a} - 5 = 4$

145. $\frac{1}{5} + \sqrt{y} = 1$ **146.** $\sqrt{\frac{x}{3}} = 6$ **147.** $\sqrt{n - 2} = 9$

148. $4\sqrt{5t} = 8$ **149.** $\sqrt{3z} + 2 = 5$ **150.** $\sqrt{4k - 5} + 1 = 8$

151. $\sqrt{\frac{5u}{2}} - 3 = -2$ **152.** $\sqrt{\frac{4c - 3}{7}} = 3$ **153.** $8\sqrt{n} = 24\sqrt{5}$

Chapter 12

Solve. Express irrational solutions in simplest radical form. If the equation has no solution, write "no solution." (12-1)

1. $m^2 = \frac{25}{49}$ **2.** $5a^2 = 60$ **3.** $w^2 + 52 = 0$

4. $x^2 - 108 = 0$ **5.** $7u^2 - 112 = 0$ **6.** $4c^2 + 7 = 23$

7. $3t^2 - 12 = -3$ **8.** $2n^2 + 9 = 4$ **9.** $(v + 5)^2 = 16$

10. $(z - 5)^2 = 6$ **11.** $3(k + 4)^2 = 81$ **12.** $4(f - 1)^2 = 60$

13. $2(h + 7)^2 = 42$ **14.** $(2x + 3)^2 = 100$ **15.** $7(3y - 1)^2 = 168$

16. $e^2 + 6e + 9 = 64$ **17.** $a^2 - 12a + 36 = 49$ **18.** $m^2 + 18m + 81 = 36$