Math 65, HW 11 Section 8.2 Name: _____

Concept and Vocabulary Check:

1. If $\sqrt{a}$ and $\sqrt{b}$ are real numbers, then $\sqrt{a \cdot b} =$ _____.

3. Square roots with variables to even powers can be simplified using $\sqrt{x^{2n}} =$ _____. The square root of a variable raised to an even power equals the variable raised to _____ that power.

5. If $\sqrt{a}$ and $\sqrt{b}$ are real numbers, then $\sqrt{\frac{a}{b}} =$ _____, $b \neq 0$.

Practice Exercises:

Remember that throughout this chapter, variable expressions in radicands represent nonnegative real numbers.

In exercises 1 - 13, use the product rule for square roots to find each product.

1. $\sqrt{2} \cdot \sqrt{7}$

5. $\sqrt{5} \cdot \sqrt{5}$

11. $\sqrt{\frac{1}{5}a} \cdot \sqrt{\frac{1}{5}b}$

13. $\sqrt{\frac{2x}{9}} \cdot \sqrt{\frac{9}{2}}$

In exercises 15 - 53 odd, simplify each expression. If the expression cannot be simlified, so state.

15. $\sqrt{50}$

21. $\sqrt{75x}$

27. $\sqrt{y^2}$

35. $\sqrt{x^{20}}$

37. $\sqrt{25y^{10}}$

41. $\sqrt{72y^{100}}$

51. $\sqrt{8x^{17}}$

53. $\sqrt{90y^{19}}$

In exercises 55 - 91, multiply or divide as necessary and, if possible, simplify.

55. $\sqrt{3} \cdot \sqrt{15}$

85. $\frac{\sqrt{48x}}{\sqrt{3x}}$

61. $\sqrt{15x^2} \cdot \sqrt{3x}$

89. $\frac{\sqrt{150x^4}}{\sqrt{3x}}$

73. $\sqrt{\frac{x^2}{36}}$

91. $\frac{\sqrt{400x^{10}}}{\sqrt{10x^3}}$

In exercises 93 - 115, simplify each expression.

93. $\sqrt[3]{16}$

105. $\sqrt[3]{\frac{27}{8}}$

97. $\sqrt[4]{32}$

113. $\sqrt{2^{43}x^{104}y^{13}}$

103. $\sqrt[4]{4} \cdot \sqrt[4]{8}$

115. $\sqrt[3]{24x^5}$

Applications:

117. First **COPY** the figure from the book on page 583 below, then express the area of the rectangle as a square root in simplified form.

Writing in Mathematics:

122. Use words to state the product rule for square roots, $\sqrt{a} \cdot \sqrt{b} = \sqrt{ab}$. Give and example with your description.

124. Explain how to simplify square roots with variables to even powers.

125. Explain how to simplify square roots with variables to odd power.