

Concept and Vocabulary Check:

1. Two or more square roots that have the same radicands are called _____.

5. Consider the following multiplication problem:

$$(7 + \sqrt{2})(3 + \sqrt{2}).$$

Using the FOIL method, the product of the first terms is _____, the product of the outside terms is _____, the product of the inside terms is _____, and the product of the last terms is _____.

Practice Exercises:

In exercises 1 - 85 odd, add, subtract or multiply as indicated. You may need to simplify before or after performing the operation. If a problem cannot for some reason have any operation performed, so state. Assume all variables represent nonnegative real numbers.

1. $8\sqrt{3} + 5\sqrt{3}$

13. $7\sqrt{5y} - \sqrt{5y}$

5. $3\sqrt{13} - 8\sqrt{13}$

15. $\sqrt{5} + \sqrt{5}$

9. $70\sqrt{y} - 76\sqrt{7}$

23. $\sqrt{5} + \sqrt{20}$

$$29. 7\sqrt{12} + \sqrt{75}$$

$$67. (\sqrt{11} + 5)(\sqrt{11} - 5)$$

$$31. 3\sqrt{27} - 2\sqrt{18}$$

$$71. (2\sqrt{3} + 7)(2\sqrt{3} - 7)$$

$$37. \sqrt{2} + \sqrt{11}$$

$$75. (\sqrt{2} + \sqrt{3})^2$$

$$47. \sqrt{3}(5 + \sqrt{3})$$

$$77. (\sqrt{x} - \sqrt{10})^2$$

$$51. (5 + \sqrt{2})(6 + \sqrt{2})$$

$$81. 6y^2\sqrt{x^5y} + 2x^2\sqrt{xy^5}$$

$$55. (6 - 3\sqrt{7})(2 - 5\sqrt{7})$$

Applications:

In exercises 87 and 91 odd, write expressions for the perimeter and area of each figure. Then simplify these expressions. Assume that all measures are given in inches. **BEFORE COMPLETING EACH PROBLEM, COPY THE FIGURES FROM THE BOOK ONTO THIS PAGE.**

87.

91.

95. The bar graph on page 590 shows the percentage of full-time college students in the United States who had jobs for four selected years. The data can be described by the mathematical model

$$J = 1.4\sqrt{x} + 55 - (20 - 1.2\sqrt{x})$$

where J is the percentage of full-time college students with jobs x years after 1975. Use this information for exercise 95.

- a. Simplify the mathematical model for J .

- b. Use the simplified form of the model to find the percentage of full-time college students who had jobs in 2005. Round to the nearest percent. How does this compare with the actual percentage displayed by the bar graph?

97. The graph on page 590 is of the model given before exercise 95, for the percentage of full-time college students with jobs. Use that graph to solve exercise 97.

a. Copy the graph onto this page *with a ruler and even tick marks* then identify your solution from exercise 95(b) as a point on the graph.

b. Use the graph to estimate the percentage of full-time college students who will have jobs in 2025.