

**EXTRA PRACTICE 36****Addition, Subtraction, and More Multiplication with Radicals**

Use after Section 9.4

Name \_\_\_\_\_

Examples: Add or subtract. Simplify by collecting like radical terms, if possible.

a)  $5\sqrt{6} + 8\sqrt{6} = (5 + 8)\sqrt{6} = 13\sqrt{6}$

b)  $8\sqrt{2} - \sqrt{18} = 8\sqrt{2} - \sqrt{9 \cdot 2}$   
 $= 8\sqrt{2} - 3\sqrt{2}$   
 $= (8 - 3)\sqrt{2} = 5\sqrt{2}$

Multiply.

a)  $\sqrt{5}(\sqrt{6} + \sqrt{3}) = \sqrt{5} \cdot \sqrt{6} + \sqrt{5} \cdot \sqrt{3}$   
 $= \sqrt{30} + \sqrt{15}$

b)  $(3 + \sqrt{2})(9 + \sqrt{2}) = 3 \cdot 9 + 3 \cdot \sqrt{2} + \sqrt{2} \cdot 9 + \sqrt{2} \cdot \sqrt{2}$   
 $= 27 + 3\sqrt{2} + 9\sqrt{2} + 2$   
 $= 29 + 12\sqrt{2}$

Add or subtract. Simplify by collecting like radical terms, if possible.

1.  $4\sqrt{5} + 6\sqrt{5}$  \_\_\_\_\_

2.  $9\sqrt{3} - 2\sqrt{3}$  \_\_\_\_\_

3.  $3\sqrt{2a} + \sqrt{2a}$  \_\_\_\_\_

4.  $6\sqrt{11} + 2\sqrt{11} + \sqrt{11}$  \_\_\_\_\_

5.  $\sqrt{x} - \sqrt{4x}$  \_\_\_\_\_

6.  $2\sqrt{50} + 8\sqrt{2}$  \_\_\_\_\_

7.  $6\sqrt{12} - 3\sqrt{3}$  \_\_\_\_\_

8.  $\sqrt{80} + \sqrt{20}$  \_\_\_\_\_

9.  $\sqrt{72} - \sqrt{98}$  \_\_\_\_\_

10.  $\sqrt{125} - 3\sqrt{20} + 4\sqrt{45}$  \_\_\_\_\_

11.  $5\sqrt{24} + 2\sqrt{54} - \sqrt{96}$  \_\_\_\_\_

12.  $\sqrt{49a} - 5\sqrt{a} + \sqrt{81a}$  \_\_\_\_\_

**EXTRA PRACTICE 36 (continued)**  
**Addition, Subtraction, and More Multiplication with Radicals**  
**Use after Section 9.4**

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Multiply.

13.  $\sqrt{2}(\sqrt{7} + \sqrt{5})$  \_\_\_\_\_ 14.  $\sqrt{10}(\sqrt{3} - \sqrt{2})$  \_\_\_\_\_

15.  $(4 + \sqrt{6})(3 + \sqrt{6})$  \_\_\_\_\_ 16.  $(8 - \sqrt{10})(5 - \sqrt{10})$  \_\_\_\_\_

17.  $(\sqrt{7} + 1)(\sqrt{7} - 8)$  \_\_\_\_\_ 18.  $(\sqrt{3} + 5)(\sqrt{3} - 5)$  \_\_\_\_\_

19.  $(\sqrt{2} - \sqrt{11})(\sqrt{2} + \sqrt{11})$  \_\_\_\_\_ 20.  $(6 + 5\sqrt{3})(1 - \sqrt{3})$  \_\_\_\_\_

21.  $(2 - \sqrt{6})(4 + 3\sqrt{6})$  \_\_\_\_\_ 22.  $(5 + \sqrt{2})^2$  \_\_\_\_\_

23.  $(8 - \sqrt{3})^2$  \_\_\_\_\_ 24.  $(6 - 2\sqrt{5})^2$  \_\_\_\_\_

25.  $(\sqrt{x} + \sqrt{7})^2$  \_\_\_\_\_ 26.  $(\sqrt{6} - \sqrt{y})^2$  \_\_\_\_\_