

**3.3 Multiplying, Adding, and Subtracting Radicals****Multiply, then simplify.**

1.  $\sqrt{20} \cdot \sqrt{5}$

2.  $\sqrt{6} \cdot \sqrt{2}$

3.  $\sqrt{7} \cdot 3\sqrt{7}$

4.  $-2\sqrt{6} \cdot 7\sqrt{15}$

5.  $(2\sqrt{3})^2$

6.  $\sqrt[4]{24} \cdot \sqrt[4]{2}$

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

7.  $4\sqrt{3} + 7\sqrt{3}$

8.  $7\sqrt[3]{4} - 5\sqrt[3]{4}$

9.  $9\sqrt[3]{7} - \sqrt[3]{7} + 4\sqrt[3]{7} - 2\sqrt[3]{7}$

10.  $10\sqrt{2} + 9\sqrt{3} - 7\sqrt{3} - 15\sqrt{2}$

11.  $\sqrt{12} - \sqrt{3} + \sqrt{48}$

12.  $9\sqrt{18} - 4\sqrt{2}$

13.  $3\sqrt{45} - 8\sqrt{20}$

14.  $\sqrt{12} + \sqrt{50} - \sqrt{20}$

15.  $\sqrt{27} + 2\sqrt{50} - 5\sqrt{8}$

16.  $\sqrt[3]{16} - \sqrt[3]{54} + \sqrt[3]{81}$

**Multiply. Don't forget to simplify all your answers as much as possible.**

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

18.  $\sqrt{2}(3\sqrt{10} - \sqrt{8})$

19.  $(2 + \sqrt{6})(5 - \sqrt{6})$

20.  $(4\sqrt{2} + \sqrt{7})(\sqrt{3} - 3\sqrt{5})$

21.  $(3 + \sqrt{11})(3 - \sqrt{11})$

22.  $(2 + 3\sqrt{5})(2 - 3\sqrt{5})$

23.  $(4 + \sqrt{7})^2$

24.  $(5 - 2\sqrt{10})^2$