

Section 8.4

Algebra II: Multiply and Divide Square Roots

Essential Question:

How do you multiply + divide radicals?

$$1) \sqrt{2} \cdot \sqrt{8} = \sqrt{2 \cdot 8}$$

$$\sqrt{\cancel{2} \cdot \cancel{2} \cdot 2 \cdot 2}$$

$$2 \cdot 2 = \boxed{4}$$

$$3x \cdot \cancel{4x}$$

$$= 12x^2$$

$$2) \underline{3}\sqrt{\underline{2}} \cdot \underline{4}\sqrt{\underline{3}} = 3 \cdot 4 \sqrt{2 \cdot 3}$$

$$\boxed{12\sqrt{6}}$$

$$3) 3\sqrt{a} \cdot 2\sqrt{a} = 3 \cdot 2 \sqrt{\cancel{a} \cdot \cancel{a}}$$

$$\boxed{6a}$$

$$4) \frac{\sqrt{18}}{\sqrt{2}} = \sqrt{\frac{18}{2}} = \sqrt{9} = \sqrt{\cancel{3} \cdot \cancel{3}}$$

$$\boxed{= 3}$$

$$5) \frac{\sqrt{12}}{\sqrt{6}} = \sqrt{\frac{12}{6}} = \boxed{\sqrt{2}}$$

$$6) \frac{\sqrt{x^3}}{\sqrt{x}} = \sqrt{\frac{\cancel{x} \cdot x \cdot x}{\cancel{x}}} = \sqrt{\cancel{x} \cdot x}$$

$$\boxed{= x}$$

Name \_\_\_\_\_

**Simplify.**

1)  $\sqrt{3} \cdot \sqrt{3}$

2)  $\sqrt{2} \cdot \sqrt{2}$

3)  $\sqrt{3} \cdot \sqrt{6}$

$$\begin{aligned} &\sqrt{3 \cdot 6} \\ &\sqrt{\overset{1}{\cancel{3}} \cdot \overset{2}{\cancel{3}} \cdot 2} \\ &= 3\sqrt{2} \end{aligned}$$

4)  $\sqrt{2} \cdot \sqrt{6}$

5)  $2 \cdot 2\sqrt{3}$

6)  $2\sqrt{3} \cdot 2\sqrt{2}$

7)  $5 \cdot \sqrt{18}$

8)  $2\sqrt{18} \cdot 3$

9)  $\sqrt{12} \cdot \sqrt{3}$

10)  $\sqrt{24} \cdot \sqrt{2}$

11)  $\sqrt{x} \cdot \sqrt{x}$

12)  $2\sqrt{x} \cdot 4\sqrt{x}$

13)  $\frac{\sqrt{14}}{\sqrt{2}}$

14)  $\frac{\sqrt{18}}{\sqrt{3}}$

15)  $\frac{10\sqrt{6}}{\sqrt{3}}$

16)  $\sqrt{\frac{2}{3}} \cdot \sqrt{\frac{3}{2}} = \sqrt{\frac{2 \cdot 3}{3 \cdot 2}}$

$$= \sqrt{\frac{6}{6}} = \sqrt{1}$$

$\boxed{= 1}$

17)  $\frac{2\sqrt{x}}{\sqrt{x}} = \boxed{2}$

18)  $\frac{\sqrt{27a^2}}{\sqrt{3a^2}}$