

## Warm Up

Simplify.

1)  $3\sqrt{18} - 2\sqrt{18}$

$3\sqrt{2}$

$$\sqrt{18} \begin{matrix} 18 \\ \wedge \\ 9 \cdot 2 \\ \wedge \\ (3 \cdot 3) \end{matrix}$$

$$3\sqrt{2}$$

$$-5\sqrt{45}$$

$$-15\sqrt{5}$$

2)  $-3\sqrt{45} - 2\sqrt{45}$

$-15\sqrt{5}$

3)  $\sqrt[3]{4} \cdot \sqrt[3]{20}$

$2\sqrt[3]{10}$

$$\sqrt[3]{4 \cdot 20}$$

$$\sqrt[3]{80}$$

$$45 \begin{matrix} 45 \\ \wedge \\ 9 \cdot 5 \\ \wedge \\ (3 \cdot 3) \end{matrix}$$

$$80 \begin{matrix} 80 \\ \wedge \\ 4 \cdot 20 \\ \wedge \\ (2 \cdot 2) \cdot (2 \cdot 2) \cdot 10 \\ \wedge \\ (2 \cdot 2) \cdot (2 \cdot 2) \cdot 5 \end{matrix}$$

$$10 \begin{matrix} 10 \\ \wedge \\ 2 \cdot 5 \\ \wedge \\ (2 \cdot 5) \end{matrix}$$

$$15 \begin{matrix} 15 \\ \wedge \\ 3 \cdot 5 \\ \wedge \\ (3 \cdot 5) \end{matrix}$$

4)  $\sqrt[3]{100} \cdot \sqrt[3]{25}$

$5\sqrt[3]{20}$

$$100 \begin{matrix} 100 \\ \wedge \\ 10 \cdot 10 \\ \wedge \\ (2 \cdot 5) \cdot (2 \cdot 5) \end{matrix}$$

$$25 \begin{matrix} 25 \\ \wedge \\ 5 \cdot 5 \\ \wedge \\ (5 \cdot 5) \end{matrix}$$

$$\sqrt[3]{100 \cdot 25}$$

5)  $\sqrt{10} \cdot \sqrt{15}$

$5\sqrt{6}$

$$\sqrt{10 \cdot 15}$$

$$5\sqrt{6}$$

$5\sqrt[3]{20}$

## Rationalizing the Denominator

You can't have a radical in the denominator, so we will rationalize the denominator. To do this you multiply both the numerator and denominator by the radical in the denominator.

$$\sqrt{a} \cdot \sqrt{a} = a$$

$$\frac{2\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{2\sqrt{5}}{5}$$

$\sqrt{25} = 5$

$$\frac{7\sqrt{7}}{\sqrt{7}\sqrt{7}} = \frac{7\sqrt{7}}{7} = \sqrt{7}$$

$$\frac{3\sqrt{3}}{4\sqrt{3}\sqrt{3}} = \frac{3\sqrt{3}}{12}$$

$\sqrt{3} \cdot \sqrt{3} = 3$

## Practice

$$\text{a. } \frac{1 \sqrt{3}}{\sqrt{3} \sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\text{b. } \frac{4 \sqrt{2} \sqrt{5}}{\sqrt{5} \sqrt{5}} = \frac{4 \sqrt{10}}{5}$$

$$\text{c. } \frac{2 \sqrt{6} \sqrt{3}}{\sqrt{3} \sqrt{3}} = \frac{2 \sqrt{18}}{3} = \frac{6 \sqrt{2}}{3} = 2 \sqrt{2}$$

$\begin{array}{r} 18 \\ 9 \times 2 \\ \hline 33 \end{array}$

Practice with in class worksheet.

$$18. \frac{2}{\sqrt{12}} \cdot \frac{\sqrt{12}}{\sqrt{12}} = \frac{2\sqrt{12}}{12}$$

$\begin{matrix} 12 \\ \uparrow \\ 4 \cdot 3 \\ \textcircled{2 \cdot 2} \end{matrix}$

$$\frac{4\sqrt{3}}{12} = \frac{\sqrt{3}}{3}$$

$$15. (27x^4y)^{2/3}$$

$$\left(\sqrt[3]{27}\right)^2 \cdot x^{4 \cdot 2/3} \cdot y^{2/3}$$

$$9x^4y^{2/3}$$

