

Warm Up

$$1. \sqrt{54} = 3\sqrt{6}$$

$$5. 6\sqrt{3} + 8\sqrt{48}$$

$$2. \sqrt{a^7 b^{31}} = a^3 b^{15} \sqrt{ab}$$

$$3. 5\sqrt{3} - 10\sqrt{3} = -5\sqrt{3}$$

$$4. \begin{aligned} &5\sqrt{75} \\ &5 \cdot 5\sqrt{3} \\ &25\sqrt{3} \end{aligned}$$

$$\begin{aligned} &\sqrt{75} \\ &\quad \wedge \quad \wedge \\ &\quad 25 \quad 3 \\ &\quad \wedge \\ &\quad 5 \quad 5 \\ &\hline &\sqrt{75} \\ &\hline &\sqrt{5 \cdot 5 \cdot 3} \\ &\hline &\sqrt{5 \cdot 5} \sqrt{3} \\ &\quad \underline{5\sqrt{3}} \end{aligned}$$

$$6\sqrt{3} + 8\sqrt{48}$$

$$6\sqrt{3} + 8 \cdot 4\sqrt{3}$$

$$6\sqrt{3} + 32\sqrt{3}$$

$$38\sqrt{3}$$

$$\sqrt{48}$$

$$\sqrt{4 \cdot 4 \cdot 3}$$

$$4\sqrt{3}$$

$$7\sqrt{5} + \sqrt{125} - 3\sqrt{25}$$

$$7\sqrt{5} + 5\sqrt{5} - 15$$

$$12\sqrt{5} - 15$$

$$\begin{aligned} &\sqrt{600} \\ &\sqrt{100 \cdot 6} \\ &\sqrt{10 \cdot 10 \cdot 6} \\ &10\sqrt{6} \end{aligned}$$

$$\sqrt{24} + \sqrt{36} + 2\sqrt{600}$$

$$\underline{\underline{2\sqrt{6}}} + 6 + \frac{2 \cdot 10\sqrt{6}}{\underline{\underline{20\sqrt{6}}}}$$

$$22\sqrt{6} + 6$$

Dividing Radicals

$$\sqrt{\frac{16}{8}} = \sqrt{\frac{\cancel{8} \cdot 2}{\cancel{8}}} = \sqrt{\frac{2}{1}} = \sqrt{2}$$

Simplify
fractions

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

factor

$$\sqrt{\frac{27}{48}} = \sqrt{\frac{3 \cdot 3 \cdot \cancel{3}}{2 \cdot 2 \cdot 2 \cdot 2 \cdot \cancel{3}}}$$

cross-out
common
terms

$$\sqrt{6} = \sqrt{2} \sqrt{3}$$

$$\begin{aligned} &= \sqrt{\frac{3 \cdot 3}{2 \cdot 2 \cdot 2 \cdot 2}} \\ &= \frac{\sqrt{3 \cdot 3}}{\sqrt{2 \cdot 2 \cdot 2 \cdot 2}} \\ &= \frac{3}{2 \cdot 2} \\ &= \frac{3}{4} \end{aligned}$$

$$\sqrt{\frac{16}{25}} = \sqrt{\frac{4 \cdot 4}{5 \cdot 5}}$$
$$= \frac{\sqrt{4 \cdot 4}}{\sqrt{5 \cdot 5}} = \frac{4}{5}$$

$$\sqrt{5 \cdot 5} = 5$$

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

$$\begin{array}{r} 32 \\ \div 2 \\ \hline 16 \end{array}$$

$$\begin{array}{r} 32 \\ \times 2 \\ \hline 16 \end{array}$$

$$3^2 = 9 = 3 \cdot 3$$

$$\sqrt{9} = 3$$

Rationalizing the denominator

NO RADICALS IN
THE DENOMINATOR

ex. $\sqrt{\frac{1}{2}} = \frac{\sqrt{1}}{\sqrt{2}} = \frac{1}{\sqrt{2}}$

$$\frac{1}{\sqrt{2}} \cdot 1 = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2} \cdot \sqrt{2}}$$

↑
ees does
nothing

Rationalize the denominator...

ex. $\sqrt{\frac{2}{3}}$

$$= \frac{\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{6}}{3}$$

ex. $\sqrt{\frac{7}{5}}$

$$= \frac{\sqrt{7}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{35}}{5}$$

HOMework

**WS Dividing
Radicals (1-12)**