Warm Up!

Simplify the following expression. Be sure to rationalize your denominator!

$$\sqrt{\frac{8\div 2}{6\div 2}} = \sqrt{\frac{4}{3}} = \frac{\sqrt{4}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{12}}{3}$$

$\sqrt{12} \rightarrow$ 12 → 3 · 4 → $2\sqrt{3}$ (2 · 2)

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

Operations with Radicals

Clear Learning Target

You will be able to apply addition, subtraction, and multiplication to expressions with radicals.

Example #1: Simplify. $4\sqrt{5} + 2\sqrt{5}$

Before:

$4x + 2x = 6x$

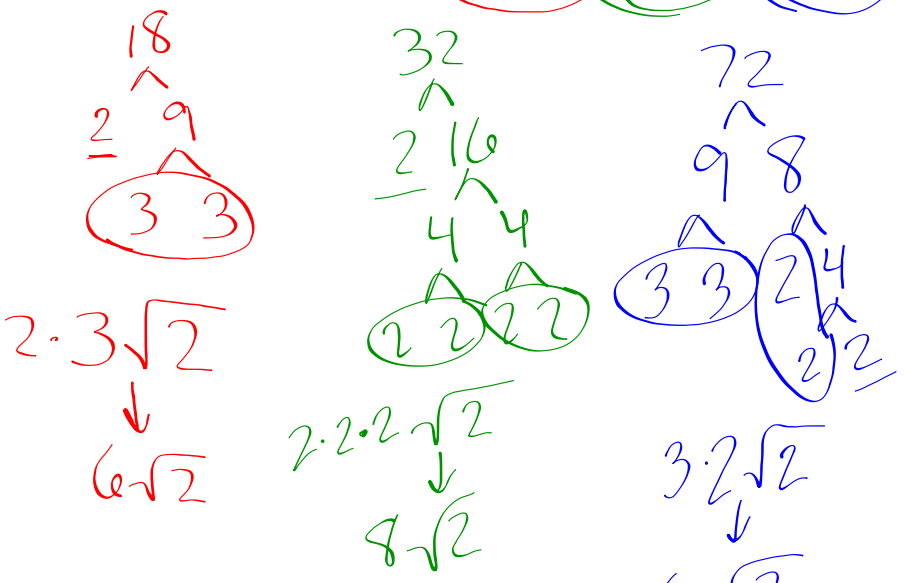
* to combine, radicals must match!

Now:

$4\sqrt{5} + 2\sqrt{5} = \boxed{6\sqrt{5}}$

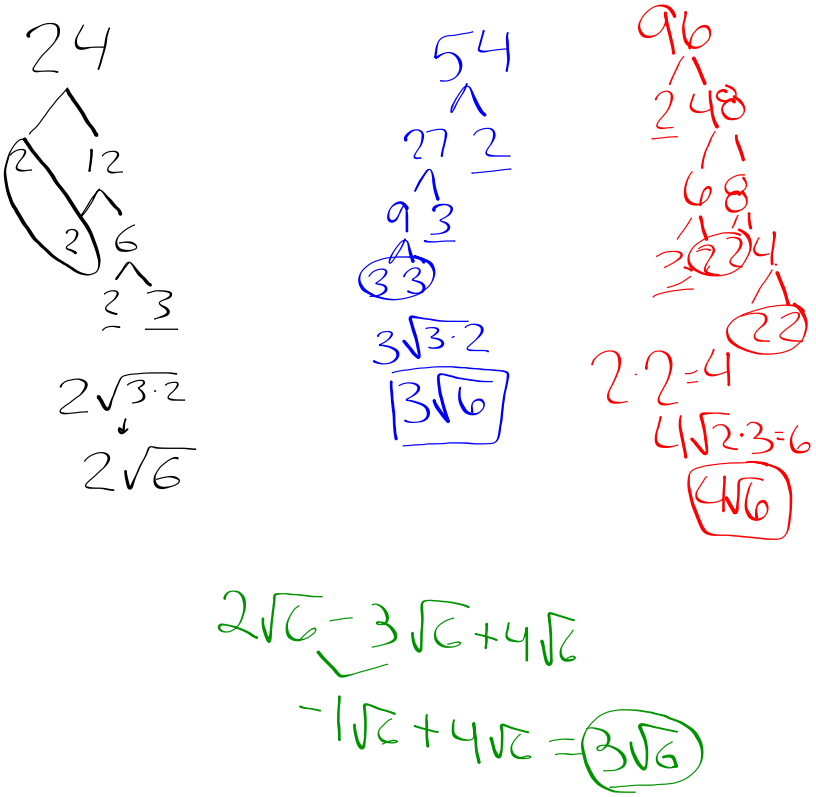
You Try! Simplify. $9\sqrt{3} - 2\sqrt{3} = \boxed{7\sqrt{3}}$

Example #2: Simplify. $2\sqrt{18} + 2\sqrt{32} + \sqrt{72}$



$6\sqrt{2} + 8\sqrt{2} + 6\sqrt{2} = \boxed{20\sqrt{2}}$

You Try! Simplify. $\sqrt{24} - \sqrt{54} + \sqrt{96}$



Example #3: Simplify. $3\sqrt{5}(2\sqrt{5} + 5\sqrt{3})$

$3\sqrt{5}\cdot2\sqrt{5} + 3\sqrt{5}\cdot5\sqrt{3}$

$6\sqrt{25} + 15\sqrt{15}$

$6\cdot5 + 15\sqrt{15}$

$30 + 15\sqrt{15}$

15
5 3

You Try! Simplify. $3\sqrt{2}(4\sqrt{3} + 6\sqrt{2})$

$3\sqrt{2} \cdot 4\sqrt{3} + 3\sqrt{2} \cdot 6\sqrt{2}$

$12\sqrt{6} + 18\sqrt{4}$

$12\sqrt{6} + 18 \cdot 2 = 12\sqrt{6} + 36$