

Simplify.

This is combining like terms after you simplify each of the radicals.

$$5\sqrt{18} + 6\sqrt{12} - \sqrt{8} - 2\sqrt{27}$$

Handwritten simplification steps:

$$\begin{aligned} & \overset{9\cdot 2}{\underbrace{15\sqrt{2}}} + \overset{4\cdot 3}{\underbrace{12\sqrt{3}}} - \overset{4\cdot 2}{\underbrace{2\sqrt{2}}} - \overset{9\cdot 3}{\underbrace{6\sqrt{3}}} \\ & \quad \underbrace{13\sqrt{2} + 6\sqrt{3}} \end{aligned}$$

Like Radicals must have:

- same index
- same radicand

Simplify.

$$10\sqrt[3]{54} + \sqrt{8} - 2\sqrt[3]{16} + 5\sqrt{32}$$

Handwritten simplification steps:

$$\begin{aligned} & \overset{27\cdot 2}{\underbrace{30\sqrt[3]{2}}} + \overset{4\cdot 2}{\underbrace{2\sqrt{2}}} - \overset{8\cdot 2}{\underbrace{4\sqrt[3]{2}}} + \overset{16\cdot 2}{\underbrace{20\sqrt{2}}} \\ & \quad = \underbrace{22\sqrt{2} + 26\sqrt[3]{2}} \end{aligned}$$

Simplify.

This is Distributive Property

$$\begin{aligned} & \sqrt{2}(7 - \sqrt{8}) \\ & = 7\sqrt{2} - \sqrt{16} \\ & = \underbrace{7\sqrt{2} - 4} \end{aligned}$$

Simplify.

$$9\sqrt{5}(2 - 3\sqrt{5})$$

Handwritten simplification steps:

$$\begin{aligned} & 9\cdot 2\cdot \sqrt{5} - 9\cdot 3\cdot \sqrt{5}\cdot \sqrt{5} \\ & = 18\sqrt{5} - 27\cdot 5 \\ & = \underbrace{18\sqrt{5} - 135} \end{aligned}$$

Simplify.

$$\begin{array}{l}
 2 \cdot 5 \cdot \sqrt{3} \cdot \sqrt{3} \\
 2 \sqrt{3} (7 \sqrt{2} + 5 \sqrt{3}) \\
 2 \cdot 7 \cdot \sqrt{3} \cdot \sqrt{2} \\
 14 \sqrt{6} + 10 \cdot 3 \\
 = 14 \sqrt{6} + 30
 \end{array}$$

Sec 7-3: Binomial Radical Expressions.

Simplify.

$$\begin{array}{l}
 (5 - \sqrt{2})(6 + \sqrt{3}) \\
 30 + 5\sqrt{3} - 6\sqrt{2} - \sqrt{6}
 \end{array}$$

There are no like radicals, therefore, none of the terms can be combined.

Expand.

$$\begin{array}{l}
 (2 - \sqrt{3})(4 + 10\sqrt{3}) \\
 8 + 20\sqrt{3} - 4\sqrt{3} - 10\sqrt{9} \\
 -22 + 16\sqrt{3} \quad \begin{array}{l} -10 \cdot 3 \\ -30 \end{array}
 \end{array}$$

Expand.

$$\begin{array}{l}
 (2 - \sqrt{27})(11 + \sqrt{12}) \\
 (2 - 3\sqrt{3})(11 + 2\sqrt{3}) \\
 22 + 4\sqrt{3} - 33\sqrt{3} - 6\sqrt{9} \\
 4 - 29\sqrt{3} \quad \begin{array}{l} -18 \end{array}
 \end{array}$$