

Adding and Subtracting Radicals

<u>Combining Like Terms</u>	<u>Combining Like Radicals</u>
$\begin{array}{l} \underline{6x} + \underline{x} \\ 7x \\ \\ \underline{3x} - \underline{4x} \\ -x \\ \\ \underline{y} + \underline{y} \\ 2y \end{array}$	$\begin{array}{l} \underline{6\sqrt{2}} + \underline{\sqrt{2}} \\ 7\sqrt{2} \\ \\ \underline{3\sqrt{5}} - \underline{4\sqrt{5}} \\ -\sqrt{5} \\ \\ \underline{\sqrt{3}} + \underline{\sqrt{3}} \\ 2\sqrt{3} \end{array}$

Combining (adding/subtracting) radicals is just like combining like terms:

ADD THE COEFFICIENTS AND THE RADICAL (OR VARIABLE) STAYS THE SAME

When combining (adding/subtracting) radicals, does the number inside the radical change?

NO !!

What happens when there are NO like radicals to combine?

- CHECK TO SEE IF ANY OF THE RADICALS CAN SIMPLIFY. THEN SEE IF YOU HAVE LIKE VARIABLES
- IF NONE OF THE RADICALS ARE SIMILAR THEN THERE IS NOTHING LEFT TO DO OR SIMPLIFY!

Example 1: No like radicals and no radicals to simplify	$\begin{array}{l} 2\sqrt{5} + 5\sqrt{2} \\ \underline{2\sqrt{5} + 5\sqrt{2}} \end{array}$ <p style="color: blue; font-size: 0.8em;">NOT ALIKE. NOTHING TO SIMPLIFY!</p>
Example 2: 2 like radicals and 1 unlike radicals (nothing can simplify)	$\begin{array}{l} 2\sqrt{5} + 5\sqrt{2} - 3\sqrt{5} \\ \underline{-\sqrt{5} + 5\sqrt{2}} \end{array}$ <p style="color: blue; font-size: 0.8em;">$\sqrt{5}$ ARE SIMILAR</p>
Example 3: 1 radical can simplify	$\begin{array}{l} \sqrt{6} + \sqrt{24} \\ \phantom{\sqrt{6}} \uparrow \begin{array}{l} 3 \cdot 8 \\ 4 \cdot 2 \end{array} \\ \phantom{\sqrt{6}} \begin{array}{l} 2 \cdot 2 \end{array} \\ \sqrt{6} + 2\sqrt{6} \\ \underline{3\sqrt{6}} \end{array}$ <p style="color: blue; font-size: 0.8em;">(2)(2)(3)</p>
Example 4: 2 radicals can simplify	$\begin{array}{l} 5\sqrt{18} - 4\sqrt{8} \\ \phantom{5\sqrt{18}} \uparrow \begin{array}{l} 9 \cdot 2 \\ 3 \cdot 3 \end{array} \phantom{4\sqrt{8}} \uparrow \begin{array}{l} 4 \cdot 2 \\ 2 \cdot 2 \end{array} \\ \phantom{5\sqrt{18}} \begin{array}{l} 15\sqrt{2} - 8\sqrt{2} \\ \underline{7\sqrt{2}} \end{array} \end{array}$ <p style="color: blue; font-size: 0.8em;">(3)(3) (2)(2)</p>