Adding and Subtracting Radicals

Combining Like Terms	Combining Like Radicals
$6x + x$ $\longrightarrow$	$6\sqrt{2} + \sqrt{2}$
$3x - 4x$ $\longrightarrow$	$3\sqrt{5} - 4\sqrt{5}$
$y + y$ $\longrightarrow$	$\sqrt{3} + \sqrt{3}$

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

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

_____!!

What happens when there are NO like radicals to combine?

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  _____

- _____
  _____

Example 1: No like radicals and no radicals to simplify	$2\sqrt{5} + 5\sqrt{2}$
Example 2: 2 like radicals and 1 unlike radicals (nothing can simplify)	$2\sqrt{5} + 5\sqrt{2} - 3\sqrt{5}$
Example 3: 1 radical can simplify	$\sqrt{6} + \sqrt{24}$
Example 4: 2 radicals can simplify	$5\sqrt{18} - 4\sqrt{8}$

Let's make sure we see the difference between the different kinds of simplifying

Combining Like Terms	Simplifying	Multiplying	Combining Radicals (add/subtract)
$3x - 7x + 5$	$3\sqrt{175}$	$5\sqrt{7} \cdot \sqrt{21}$	$3\sqrt{2} - 7\sqrt{2} + 5$
$-7 - 3x + x + 8$	$-2\sqrt{40}$	$-\sqrt{6} \cdot 4\sqrt{24}$	$\sqrt{12} + 6\sqrt{3}$
$x - 2x$	$-3\sqrt{144}$	$\sqrt{10} \cdot \sqrt{70}$	$\sqrt{45} - \sqrt{20}$