Simplifying Radical Expressions
(Addition and Subtraction)

Level 1 - Simplify the radical expression by adding and subtracting
Level 2 - Simplify the radical expressions of higher order
Level 3 - Simplify the radical expressions involving variables

When adding and subtracting radicals, you can only combine "like radicals," just like you only combine like terms in algebra.

For example, $\sqrt{2}+\sqrt{2}=2\sqrt{2}$, but $\sqrt{2}+\sqrt{3}$ stays the same because they're not like radicals.

In order to find "like radicals", we may need to simplify the radicals, usually into surd form. his means the radical is fully simplified, with no perfect squares (or cubes, etc.) left inside.

For example: $\sqrt{18}$ and $\sqrt{8}$ look different, but $\sqrt{18}=3\sqrt{2}$ and $\sqrt{8}=2\sqrt{2}$.

Now you can add them: $3\sqrt{2}+2\sqrt{2}=5\sqrt{2}$.

Example #1	**Example #2**	**Example #3**
$-\sqrt{5}+3\sqrt{5}$	$\sqrt{50}-\sqrt{18}$	$\sqrt{20x^3}+\sqrt{45x^3}$
$\sqrt{5}\cdot(-1+3)$	$\sqrt{25\cdot2}-\sqrt{9\cdot2}$	$\sqrt{4\cdot5\cdot x^2\cdot x}+\sqrt{9\cdot5\cdot x^2\cdot x}$
$2\sqrt{5}$	$\sqrt{5^2\cdot2}-\sqrt{3^2\cdot2}$	$2x\sqrt{5x}+3x\sqrt{5x}$
	$5\sqrt{2}-3\sqrt{2}$	$5x\sqrt{5x}$
	$2\sqrt{2}$	

Remember:

- Always simplify radicals first. This makes it easier to see "like radicals".
- Only combine radicals if their roots and the numbers inside are the same.
- Keep answers in surd form: no perfect squares or cubes should remain under the radical.