4/19 Add, Subtract, and Multiply Radical Expressions

Add/Subtract Radicals: Think - Combine Like Terms
the "terms" must have the exact same radicand. (what's in the square root.)

* $2\sqrt{3} + 8\sqrt{3} = 10\sqrt{3}$ similar to $2x + 8x = 10x$

* $4\sqrt{10} + \sqrt{13} - 9\sqrt{10}$

$\boxed{-5\sqrt{10} + \sqrt{13}}$

* $7\sqrt{14} + \sqrt{21} - 4\sqrt{14}$

$\boxed{3\sqrt{14} + \sqrt{21}}$

* $2\sqrt{3} + \sqrt{7} + \sqrt{3} + 6\sqrt{7}$

$3\sqrt{3} + 7\sqrt{7}$

$\sqrt{3}$ and $\sqrt{7}$ have a "coefficient" of 1.

* $2\sqrt{11} + \sqrt{99}$ → $\sqrt{99}$, $\sqrt{9}\sqrt{11}$, $3\sqrt{11}$

$2\sqrt{11} + 3\sqrt{11}$

$\boxed{5\sqrt{11}}$

* $5\sqrt{7} + \sqrt{28}$ → $\sqrt{28}$, $\sqrt{4}\sqrt{7}$, $2\sqrt{7}$

$5\sqrt{7} + 2\sqrt{7}$

$7\sqrt{7}$

* $\sqrt{45} + 3\sqrt{20}$

$\sqrt{9}\sqrt{5} + 3\sqrt{4}\sqrt{5}$

$3\sqrt{5} + 3 \cdot 2\sqrt{5}$

$3\sqrt{5} + 6\sqrt{5}$

$\boxed{9\sqrt{5}}$

Multiply Radical Expressions

Distributive Property.

Dist. Prop

* $\sqrt{3}(2 + \sqrt{12})$

$\sqrt{3}(2 \cdot \sqrt{12})$ Multiplication only.

$\sqrt{3} * 2 * \sqrt{12}$

$2\sqrt{3} + \sqrt{36}$

$\boxed{2\sqrt{3} + 6}$

* $\sqrt{3}(12 - \sqrt{15})$

$12\sqrt{3} - \sqrt{45}$

$\sqrt{9}\sqrt{5}$

$\boxed{12\sqrt{3} - 3\sqrt{5}}$

* $3\sqrt{6}(4\sqrt{6} - \sqrt{600})$

$\sqrt{600}$

$\sqrt{100}\sqrt{6}$

$10\sqrt{6}$

$3\sqrt{6}(4\sqrt{6} - 10\sqrt{6})$

$3\sqrt{6}(-6\sqrt{6})$ Multiply

(3×-6) $-18\sqrt{36}$

$-18 \cdot 6$

$\boxed{-108}$

* $(6-\sqrt{7})^2$

$(6-\sqrt{7})(6-\sqrt{7})$

$36 - 6\sqrt{7} - 6\sqrt{7} + \sqrt{49}$

$36 - 12\sqrt{7} + 7$

either $\begin{cases} 43 - 12\sqrt{7} \\ -12\sqrt{7} + 43 \end{cases}$

	6	$-\sqrt{7}$	
6	36	$-6\sqrt{7}$	$-12\sqrt{7}$
$-\sqrt{7}$	$-6\sqrt{7}$	$\sqrt{49} = 7$	$36+7=43$

$43 - 12\sqrt{7}$

OR

$-12\sqrt{7} + 43$

* $(\sqrt{2}+\sqrt{5})(\sqrt{2}-3\sqrt{5})$

$\sqrt{4} - 3\sqrt{10} + \sqrt{10} - 3\sqrt{25}$

$2 - 2\sqrt{10} - 3 \cdot 5$

$2 - 2\sqrt{10} - 15$

$\boxed{-13 - 2\sqrt{10}}$

OR

$\boxed{-2\sqrt{10} - 13}$