11.2 continued: Adding and Subtracting Radicals

Goals: *Add radicals
*Subtract radicals

Radicals are like terms when: when the number under the radical sign (The radicand) is exactly the same. Combine like radical terms by adding or subtracting the coefficient.

Add or subtract:

Ex: $4\sqrt{10} + \sqrt{13} - 9\sqrt{10}$

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

Ex: $5\sqrt{3} + \sqrt{48}$

$5\sqrt{3} + \sqrt{16 \cdot 3}$
$5\sqrt{3} + 4\sqrt{3}$
$7\sqrt{3}$

Ex: $7\sqrt{14} + \sqrt{21} - 4\sqrt{14}$

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

Ex: $2\sqrt{7} + 3\sqrt{63}$

$2\sqrt{7} + 3\sqrt{9} \cdot \sqrt{7}$
$2\sqrt{7} + 9\sqrt{7}$

$11\sqrt{7}$

Ex: $2\sqrt{7} + \sqrt{28}$

$2\sqrt{7} + 2\sqrt{7}$
$4\sqrt{7}$

Multiply: Distribute. Combine like terms if possible.

Ex: $\sqrt{5}(4-\sqrt{20})$

$4\sqrt{5}-\sqrt{100}$

$4\sqrt{5}-10$

Ex: $\sqrt{3}(2+\sqrt{12})$

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

$2\sqrt{3}+6$

F.O.I.L – First, Outer, Inner, Last. This acronym tells which order to multiply. Combine like terms when done if possible.

Ex: $(\sqrt{7}+\sqrt{2})(\sqrt{7}-3\sqrt{2})$

$\sqrt{49}-3\sqrt{14}+\sqrt{14}-3\sqrt{4}$

$7-2\sqrt{14}-6$

$1-2\sqrt{14}$

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

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

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

$-13-2\sqrt{10}$