5.6 Radical Expressions Day 2

** Bottom of Page 252 **

Add and Subtract Radicals

Ex1) $2\sqrt{12} - 3\sqrt{27} + 2\sqrt{48}$

$2\sqrt{4}\sqrt{3} - 3\sqrt{9}\sqrt{3} + 2\sqrt{16}\sqrt{3}$

$2 \cdot 2\sqrt{3} - 3 \cdot 3\sqrt{3} + 2 \cdot 4\sqrt{3}$

$4\sqrt{3} - 9\sqrt{3} + 8\sqrt{3}$

$\boxed{3\sqrt{3}}$

Ex2) $3\sqrt{45} - 5\sqrt{80} + 4\sqrt{20}$

$3\sqrt{9}\sqrt{5} - 5\sqrt{16}\sqrt{5} + 4\sqrt{4}\sqrt{5}$

$3 \cdot 3\sqrt{5} - 5 \cdot 4\sqrt{5} + 4 \cdot 2\sqrt{5}$

$9\sqrt{5} - 20\sqrt{5} + 8\sqrt{5}$

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

Multiplying Radials

FOIL

Ex3) $(3\sqrt{5} - 2\sqrt{3})(2 - \sqrt{3})$

$6\sqrt{5} - 3\sqrt{15} - 4\sqrt{3} + 2\sqrt{9}$

$\boxed{6\sqrt{5} - 3\sqrt{15} - 4\sqrt{3} + 6}$

Ex4) $(4\sqrt{2} + 7)(4\sqrt{2} - 7)$

$16\sqrt{4} - 28\sqrt{2} + 28\sqrt{2} - 49$

$16 \cdot 2 - 49$

$32 - 49$

$\boxed{-17}$

Rationalizing Denominator using Conjugates:

$a\sqrt{b} - c\sqrt{d}$ and $a\sqrt{b} + c\sqrt{d}$ are conjugates

EX 5. $\left(\frac{1-\sqrt{3}}{5+\sqrt{3}}\right)\cdot\frac{(5-\sqrt{3})}{(5-\sqrt{3})} = \frac{5-1\sqrt{3}-5\sqrt{3}+3}{25-5\sqrt{3}+5\sqrt{3}-3} = \frac{8-4\sqrt{3}}{22} = \frac{4-2\sqrt{3}}{11}$

FOIL

EX 6. $\left(\frac{2+\sqrt{3}}{4-\sqrt{3}}\right)\cdot\frac{(4+\sqrt{3})}{(4+\sqrt{3})} = \frac{8+2\sqrt{3}+4\sqrt{3}+3}{16+4\sqrt{3}-4\sqrt{3}-3} = \frac{11+6\sqrt{3}}{13}$