

GCF

$$\begin{array}{l} 3 \mid 3x^2y^2 + 18x^2y + 9xy \\ x \mid x^2y^2 + 6x^2y + 3xy \\ y \mid xy^2 + 6xy + 3y \\ \hline 3xy(x^2y + 6x + 3) \end{array}$$

$$\begin{array}{l} 7 \mid 14a^5b^3c + 28a^4bc + 42ab^2 \\ 2 \mid 2a^5b^3c + 4a^4bc + 6ab^2 \\ a \mid a^5b^3c + 2a^4bc + 3ab^2 \\ b \mid a^4b^3c + 2a^3bc + 3b^2 \\ \hline 14ab(a^4b^2c + 2a^3c + 3b) \end{array}$$

Multiply

$$\begin{array}{l} (x+1)(x+2) \\ x^2 + 2x + x + 2 \\ \hline x^2 + 3x + 2 \end{array}$$

$$\begin{array}{l} (x-5)(x+4) \\ x^2 + 4x - 5x - 20 \\ \hline x^2 - x - 20 \end{array}$$

Put Together

Distribute  
Multiply  
Simplify

Pull Apart

Factor

Standard Form

$$Ax^2 + Bx + C$$

negative  $(- -)(- + -)$

Pull apart

positive  $\left. \begin{array}{l} (- + -) \\ (- -) \end{array} \right\} (- + -)$

$$(x + \_)(x + \_)$$

$$\begin{array}{l}
 x^2 + 5x + 6 \quad \textcircled{0} \quad \underline{6} \\
 (x+2)(x+3) \quad \begin{array}{l} 6 \cdot 1 \\ \underline{2 \cdot 3} \end{array} \\
 \text{what if: } x^2 + 5x - 6 \\
 (x-1)(x+6) \quad \begin{array}{l} -6 \\ \underline{-1 \cdot 6} \\ -1 \quad -6 \\ -2 \quad 3 \\ \underline{2 \quad -3} \end{array} \\
 \hline
 y^2 - 12y + 35 \\
 (y-7)(y-5)
 \end{array}$$

$$\begin{array}{l}
 x^2 + 3x - 10 \quad \begin{array}{l} -10 \\ \underline{-5 \cdot 2} \\ 5 \cdot -2 \end{array} \\
 (x+5)(x-2) \\
 x^2 - 2x + 5x - 10 \\
 x^2 + 3x - 10 \\
 \hline
 y^2 - 4y - 12 \\
 (y+2)(y-6)
 \end{array}$$

$$\begin{array}{l}
 6n^2 - 12n - 48 \\
 6(n^2 - 2n - 8) \\
 \underline{=} \\
 6(n-4)(n+2)
 \end{array}$$

$$\begin{array}{l}
 4x^2 + 28x + 24 \\
 4(x^2 + 7x + 6) \\
 4(x+6)(x+1)
 \end{array}$$

Remember: GCF  
First!

$$(x + 5)(x - 8)$$

$$x^2 - 8x + 5x - 40$$

$$x^2 - 3x - 40$$