

Multiplying Binomials

FOIL(First, Outside, Inside, Last)

When should you use FOIL?

Use FOIL when you need to multiply two binomials together

- A binomial is an expression that has 2 terms
{For example: $(x+3)$ or $(2x-5)$ }

Multiplying binomials:

$$(x + 2)(x - 4) \text{ or } (x + 2) \cdot (x - 4)$$

- Note: When two parenthesis are together, that means they are being multiplied with each other (The default operation is multiply)

Step 1: F

Multiply the first term in each binomial

$$\begin{array}{cc} (x + 2)(x - 4) \\ \uparrow \quad \uparrow \end{array}$$

$$\begin{array}{c} x \cdot x = x^2 \\ x^2 \end{array}$$

Step 2: O

Multiply the outside term in each binomial

$$\begin{array}{cc} (x + 2)(x - 4) \\ \uparrow \quad \uparrow \end{array}$$

$$\begin{array}{c} x \cdot -4 = -4x \\ x^2 - 4x \end{array}$$

Step 3: I

Multiply the inside term in each binomial

$$\begin{array}{cc} (x + 2)(x - 4) \\ \uparrow \quad \uparrow \end{array}$$

$$\begin{array}{c} 2 \cdot x = 2x \\ x^2 - 4x + 2x \end{array}$$

Step 4: L

Multiply the last term in each binomial

$$\begin{array}{cc} (x + 2)(x - 4) \\ \uparrow \quad \uparrow \end{array}$$

$$\begin{array}{c} 2 \cdot -4 = -8 \\ x^2 - 4x + 2x - 8 \end{array}$$

*After you have finished the foil method remember to combine your like terms.

Step 5: Combine like terms (The middle terms)

$$\begin{array}{c} x^2 - 4x + 2x - 8 \\ x^2 - 2x - 8 \end{array}$$

$$\text{Solution: } (x + 2)(x - 4) = x^2 - 2x - 8$$