



Factoring Trinomials ($ax^2 + bx + c$) by Trial and Error (UnFOIL)

Video Notes

[Video Link](#)

Factoring Trinomials ($ax^2 + bx + c$) by Trial and Error (UnFOIL)

What background knowledge will I need?

- How to multiply a binomial by a binomial (FOIL)

Expand:

$$\begin{array}{l} (2x + 5)(3x + 1) \\ \color{red}{6x^2} + \color{blue}{2x} + \color{green}{15x} + \color{orange}{5} \\ \color{red}{6x^2} + \color{blue}{17x} + \color{orange}{5} \end{array}$$

$\left. \begin{array}{l} F \rightarrow 6x^2 \\ 0 \\ 1 \end{array} \right\} 17x$
 $L \rightarrow 5$

Factoring \rightarrow what binomials can
I multiply together to get this
expression?

Goal: unFOIL

Factor:

$$\underline{2x^2 + 9x + 10}$$

$$F \rightarrow 2x^2$$

$$\begin{array}{r} 2 \\ 2 \overline{) 2} \end{array}$$

$$\begin{array}{r} 0 \\ + 9x \\ \hline \end{array}$$

$$L \rightarrow 10$$

$$\begin{array}{r} 10 \\ 2 \overline{) 10} \\ \hline 5 \end{array}$$

~~Trial #1:~~

$$(2x \quad 1)(x \quad 10)$$

$2x \cdot 10 = 20x$
 $1 \cdot x = x$
 No!

~~Trial #3:~~

$$(2x \quad 2)(x \quad 5)$$

$2x \cdot 5 = 10x$
 $2 \cdot x = 2x$
 No!

~~Trial #2:~~

$$(2x \quad 10x)(x \quad 1)$$

$2x \cdot 1 = 2x$
 $10x \cdot x = 10x^2$
 No!

Trial #4:

$$(2x + 5)(x + 2)$$

$2x \cdot 2 = 4x$
 $5 \cdot x = 5x$
 $4x + 5x = 9x$
 Success!

$$(2x + 5)(x + 2)$$

Factor:

$$\underline{x^2 + x - 20}$$

$$F \rightarrow x^2$$

$$\begin{array}{r} 1 \\ 1 \overline{) 1} \end{array}$$

$$\begin{array}{r} 0 \\ 1x \\ \hline \end{array}$$

$$L \rightarrow -20$$

$$\begin{array}{r} 20 \\ 2 \overline{) 20} \\ \hline 10 \\ 4 \overline{) 10} \\ \hline 5 \end{array}$$

~~Trial #1:~~

$$(x \quad 20)(x \quad 1)$$

$x \cdot 1 = x$
 $20 \cdot x = 20x$
 $20x \cdot x = 20x^2$
 ~~$20x \cdot 1 = 20x$~~

Trial #3:

$$(x \quad -4)(x + 5)$$

$x \cdot 5 = 5x$
 $-4 \cdot x = -4x$
 $5x - 4x = x$

~~Trial #2:~~

$$(x \quad 2)(x \quad 10)$$

$x \cdot 10 = 10x$
 $2 \cdot x = 2x$

$$(x - 4)(x + 5)$$

Factor:

$$x^2 - 10x + 24$$

Trial #1:

$$\begin{array}{r} \text{---} -24 \\ (x + 2)(x - 12) \\ \text{---} \\ +2x \\ \text{---} \\ -12x \end{array}$$

Trial #2:

$$\begin{array}{r} \text{---} +24 \\ (x - 4)(x - 6) \\ \text{---} \\ -4x \\ \text{---} \\ -6x \end{array}$$

$$F \rightarrow x^2$$

$$\begin{array}{r} \text{OI} \\ \text{---} \\ -10x \end{array}$$

$$L \rightarrow 24$$

$$\begin{array}{r} 24 \\ \text{---} \\ 1 \mid 24 \\ 2 \mid 12 \\ 3 \mid 8 \\ 4 \mid 6 \end{array}$$

$$\boxed{(x-4)(x-6)}$$

Factor:

$$6x^2 - 7x - 5$$

Trial #1:

$$\begin{array}{r} \text{---} \\ (x \quad 1)(6x \quad 5) \\ \text{---} \\ 6x \\ \text{---} \\ 5x \end{array}$$

Trial #2:

$$\begin{array}{r} \text{---} \\ (x \quad 5)(6x \quad 1) \\ \text{---} \\ 30x \\ \text{---} \\ x \end{array}$$

$$F \rightarrow 6x^2$$

$$\begin{array}{r} 6 \\ \text{---} \\ 1 \mid 6 \\ 2 \mid 3 \end{array}$$

$$\begin{array}{r} \text{OI} \\ \text{---} \\ -7x \end{array}$$

$$L \rightarrow -5$$

$$\begin{array}{r} 5 \\ \text{---} \\ 1 \mid 5 \end{array}$$

Trial #3:

$$\begin{array}{r} \text{---} \\ (2x + 1)(3x - 5) \\ \text{---} \\ +3x \\ \text{---} \\ -10x \end{array}$$

$$\boxed{(2x+1)(3x-5)}$$