

M9 - 5.4 - Distribution "FOIL" Notes

Expand and Simplify

$$2(x+3)$$

Distribute/Multiply

$$2x + 6$$

Negative Distribution

$$\begin{array}{r} + (x+3) \\ + 1(x+3) \\ \hline x+3 \end{array}$$

$$\begin{array}{r} -(x-2) \\ -1(x-2) \\ \hline -x+2 \end{array}$$

Backwards Distribution

$$\begin{array}{r} (x+2)(3) \\ 3x+6 \end{array}$$

Expand and Simplify

$$(x+2)(x+3) =$$

$$(x+2)(x+3) =$$

$$\begin{array}{r} x^2 + 3x + 2x + 6 \\ x^2 + 5x + 6 \end{array}$$

"FOIL" Method

- F** - multiply **First** numbers in brackets
- O** - multiply **Outside** numbers in brackets
- I** - multiply **Inside** numbers in brackets
- L** - multiply **Last** numbers in brackets

Combine like terms.

Quick Method

$$(x+2)(x+3) =$$

$$x^2 + 5x + 6$$

Alternative Method:

$$\begin{aligned} (x+2)(x+3) &= \\ x(x+3) + 2(x+3) &= \\ x^2 + 3x + 2x + 6 &= \\ x^2 + 5x + 6 & \end{aligned}$$

Multiply and combine like terms in the same step.

$$(x+2)^2$$

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

$$x^2 + 2x + 2x + 4$$

$$x^2 + 4x + 4$$

FOIL

Combine

Like Terms

$$-(x+2)(x+4)$$

$$-(x^2 + 4x + 2x + 8)$$

$$-(x^2 + 6x + 8)$$

$$-x^2 - 6x - 8$$

FOIL
Combine
Like Terms
Distribute

$$\begin{aligned} 2(x+4)(x-1) &= \\ 2(x^2 - x + 4x - 4) &= \\ 2(x^2 + 3x - 4) & \end{aligned}$$

$$2x^2 + 6x - 8$$

Expand and Simplify

$$(x+3)(x^2 - 2x + 8)$$

$$(x+3)(x^2 - 2x + 8)$$

$$(x+1)(x+2)(x-3)$$

$$(x^2 + 2x + 1x + 2)(x-3)$$

$$(x^2 + 3x + 2)(x-3)$$

Triple FOIL

FOIL

Combine

Like Terms

Then Triple FOIL

$$x^3 - 2x^2 + 8x + 3x^2 - 6x + 24$$

$$x^3 + x^2 + 2x + 24$$

Combine
Like Terms

$$(x+4) + 2(x-1)$$

$$x+4 + 2x-2$$

$$3x+2$$

Distribute

Combine

Like Terms

$$(x-2) - (x+1)(x-3)$$

$$x-2 - (x^2 - 3x + x - 3)$$

$$x-2 - (x^2 - 2x - 3)$$

$$x-2 - x^2 + 2x + 3$$

$$-x^2 + 3x + 1$$

FOIL

Distribute

Combine

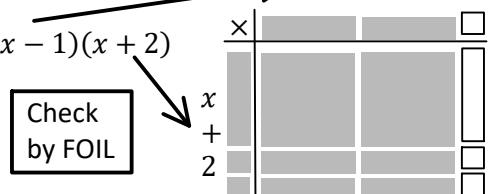
Like Terms

Algebra Tiles

$$(2x-1)(x+2)$$

Check by FOIL

$$2x - 1$$



$$2x^2 + 4x - x - 2$$

$$2x^2 + 3x - 2$$

Legend

	$= x^2$		$= -x^2$
	$= x$		$= -x$
	$= 1$		$= -1$