

# M9 - 5.4 - Distribution "FOIL" Notes

## Expand and Simplify

$$2(x+3) \quad \text{Distribute/Multiply}$$

$$2x+6$$

## Negative Distribution

$$+(x+3) \quad - (x-2)$$

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

$$x+3 \quad -x+2$$

## Backwards Distribution

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

$$3x+6$$

## Expand and Simplify

$$(x+2)(x+3) = \quad \text{"FOIL" Method}$$

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

$$x^2 + 3x + 2x + 6 =$$

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

- F** - multiply **F**irst numbers in brackets
- O** - multiply **O**utside numbers in brackets
- I** - multiply **I**nside numbers in brackets
- L** - multiply **L**ast numbers in brackets

Combine like terms.

### Quick Method

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

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

Multiply and combine like terms in the same step.

### Alternative Method:

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

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

$$x^2 + 3x + 2x + 6$$

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

$$(x+2)^2$$

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

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

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

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

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

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

$$2(x^2 + 3x - 4)$$

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

## Expand and Simplify

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

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

Triple FOIL

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

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

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

### Legend