

Distributive Property!

## Unit 3: Polynomials

3.3 Multiplying a Binomial by a Binomial

The distributive property says...

\*\*Everything from the first bracket must multiply to everything in the second bracket.\*\*

In order to make sure we don't miss terms or multiply things twice. We use the acronym FOIL to help.

- F - first
- O - outside
- I - inside
- L - last

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

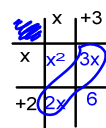
F:  $x \cdot x = x^2$   
 O:  $x \cdot 3 = 3x$   
 I:  $2 \cdot x = 2x$   
 L:  $2 \cdot 3 = 6$

$x^2 + 5x + 6$

Distributive Property!

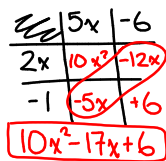
Another option is to use an Area Diagram.

Ex.)  $(x+2)(x+3)$

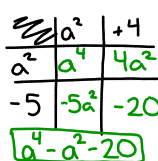


\*\*Combine like terms inside the diagram and write out your final answer.  
 $x^2 + 5x + 6$

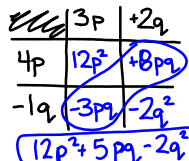
a)  $(5x-6)(2x-1)$



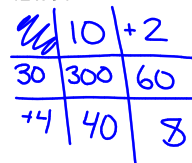
b)  $(a^2+4)(a^2-5)$



c)  $(3p+2q)(4p-q)$



d) An area diagram can also be used to multiply 2 digit numbers  
 $12 \times 34$



$$\begin{array}{r} 300 \\ + 60 \\ + 40 \\ \hline 408 \end{array}$$



Ex.) Use FOIL to determine each product:

a)  $(x+6)(x+4)$   
 $= x^2 + 4x + 6x + 24$   
 $= \boxed{x^2 + 10x + 24}$

b)  $(3x+1)(x-5)$   
 F:  $3x^2$   
 O:  $-15x$   
 I:  $+1x$   
 L:  $-5$   
 $= \boxed{3x^2 - 14x - 5}$

~~$36a^2 + 25b^2$  wrong~~  
 c)  $(6a-5b)^2$   
 $= (6a-5b)(6a-5b)$   
 $= 36a^2 - 30ab - 30ab + 25b^2$   
 $= \boxed{36a^2 - 60ab + 25b^2}$

The FOIL Song