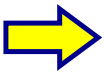
4.1 Multiplying Binomials

Given a quadratic in vertex form or factored (zeros) form, how could you rewrite it in standard form?

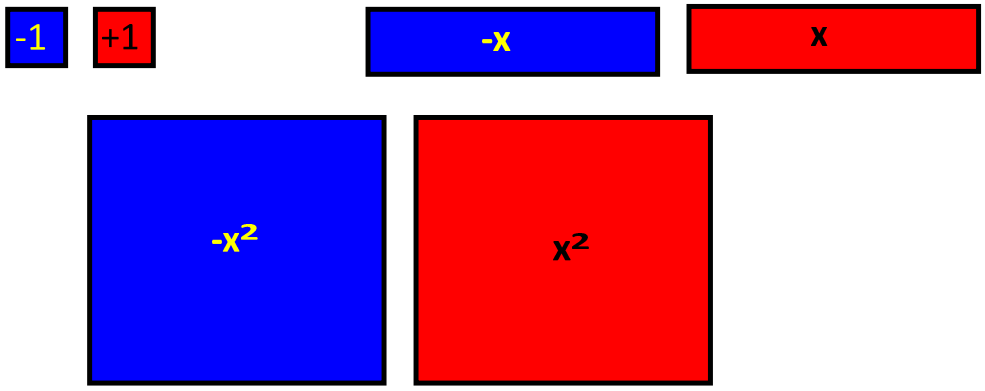
Recall:
vertex form: $y = a(x-h)^2 + k$
factored form: $y = a(x-r)(x-s)$
standard form: $y = ax^2 + bx + c$



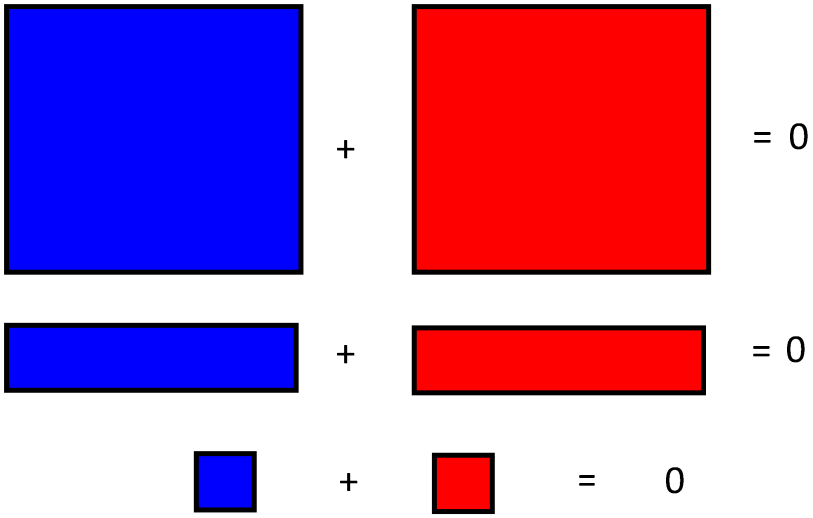
You need to be able to multiply two binomials together!

Simplifying Polynomials

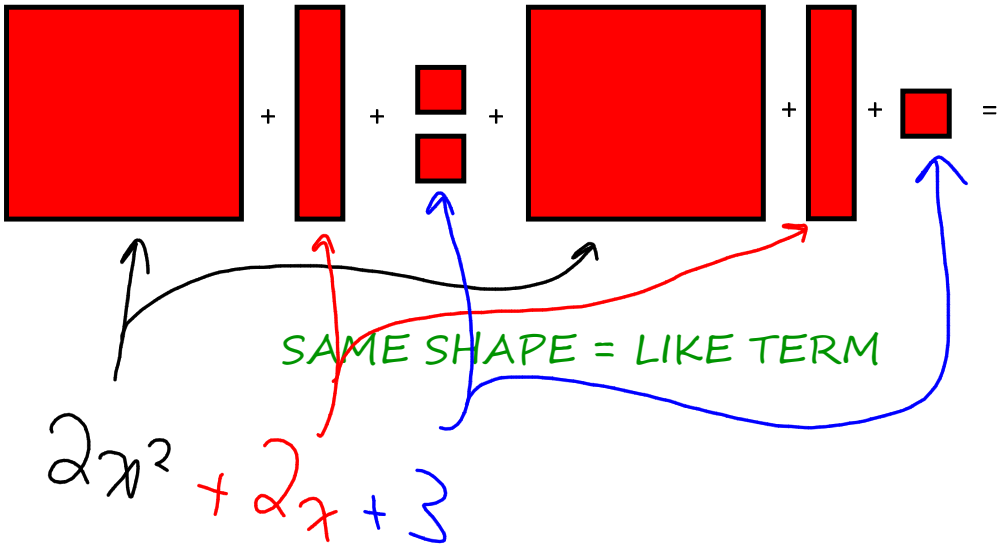
To simplify polynomials you need to identify like terms (terms with the same variables and exponents)

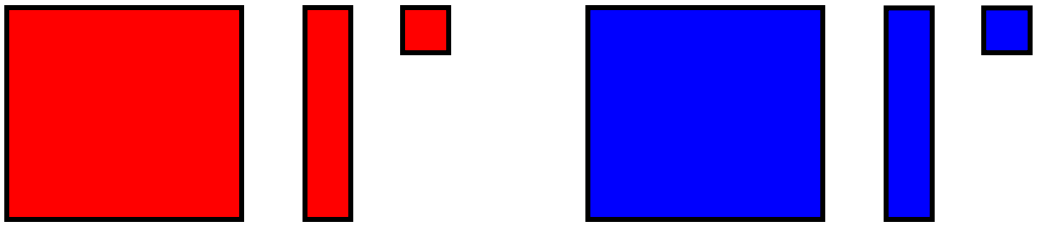


Zero Principle



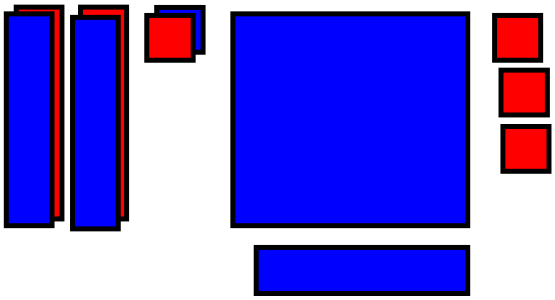
Remember.... you can only add or subtract LIKE TERMS....





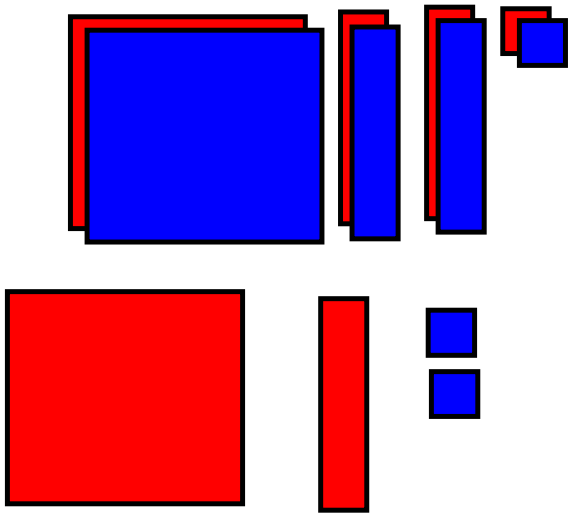
Ex. 1 Represent the simplified expression using alge-tiles

a) $(-x^2 + 2x - 1) + (4 - 3x)$



$= -x^2 - x + 3$

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



$= x^2 + x - 2$

Perform each multiplication without a calculator:

23 x 51

	20	3
50	1000	150
1	20	3

$= 1000 + 150 + 20 + 3$

$= 1173$

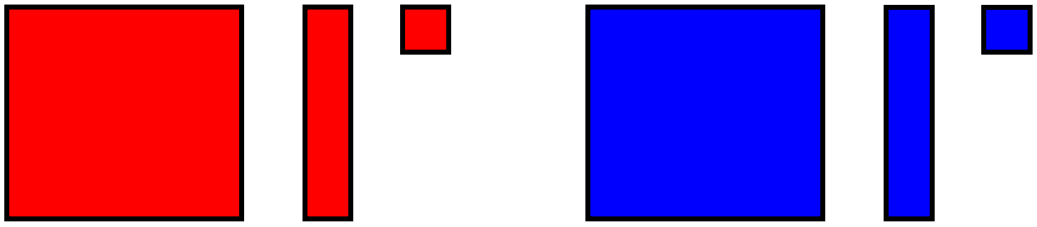
36 x 62

	30	6
60	1800	360
2	60	12

$= 1800 + 360 + 60 + 12$

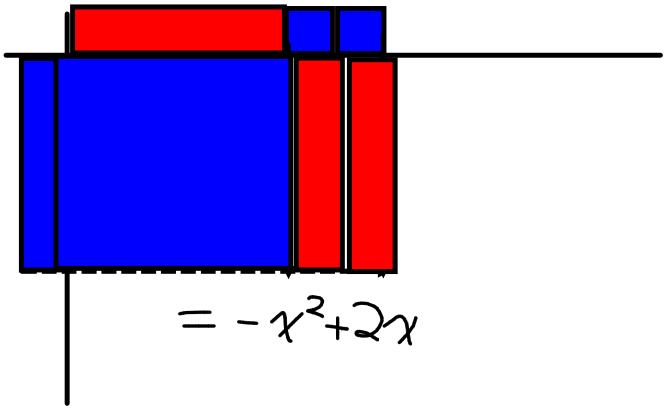
$= 2232$

This is called an area model.

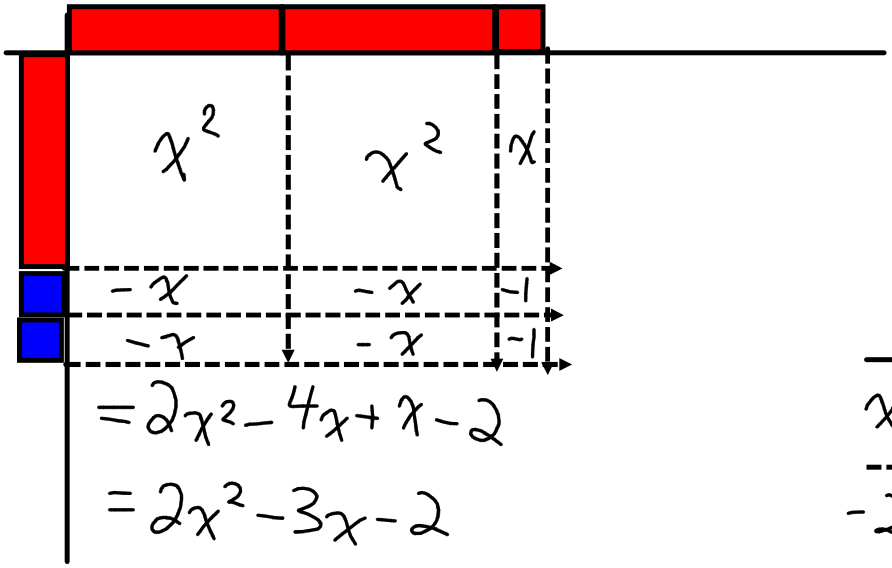


Ex. 2 Use algebra tiles to expand and simplify.

a) (-x)(x - 2)



b) (2x + 1)(x - 2)



Video...

	$2x$	1
x	$2x^2$	x
-2	$-4x$	-2

Ex. 3 Use the chart method to expand the following.

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

	3	$-x^2$
$2x^2$	$6x^2$	$-2x^4$
-1	-3	x^2

$= -2x^4 + 6x^2 + x^2 - 3$

$= -2x^4 + 7x^2 - 3$

b) $(m^2 - 2)(2m + 1)$

	$2m$	1
m^2	$2m^3$	m^2
-2	$-4m$	-2

$= 2m^3 + m^2 - 4m - 2$

now... consider the distributive property!

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

$= 2x^2 + 3x - 4x - 6$

$= 2x^2 - x - 6$

	$2x$	3
x	$2x^2$	$3x$
-2	$-4x$	-6

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

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

$= x^2 - 2x - 3$

Ex. 4 Expand and simplify.

a) (2x + 1)(x + 4)

$= 2x^2 + 8x + x + 4$

$= 2x^2 + 9x + 4$

b) (5 + 2x)(-2 + 3x)

$= -10 + 15x - 4x + 6x^2$

$= 6x^2 + 11x - 10$

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

$= 6q^2 + 4qp - 9pq - 6p^2$

$= 6q^2 - 5pq - 6p^2$

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

$= -3(2x^2 + x + 6x + 3)$

$= -3(2x^2 + 7x + 3)$

$= -6x^2 - 21x - 9$

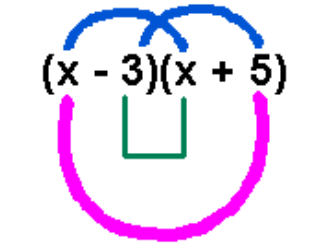
e) $(x^2-3x-4)(2x^2-4x+5)$

$= 2x^4 - 4x^3 + 5x^2 - 6x^3 + 12x^2 - 15x - 8x^2 + 16x - 20$

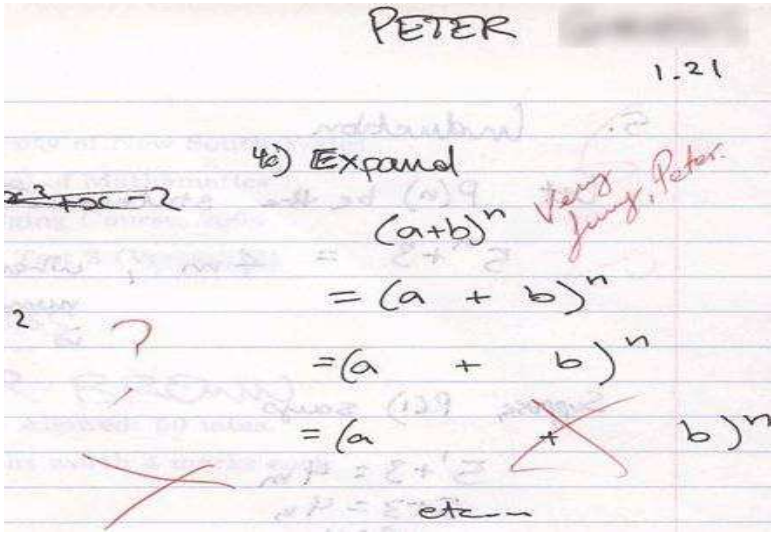
$= 2x^4 - 10x^3 + 9x^2 + x - 20$

Multiply:

$(x - 3)(x + 5)$



The Man With
The Big Nose



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8ace, 9, 10, 14, 16