Factoring Simple Quadratic Trinomials in the form $x^2 + bx + c$

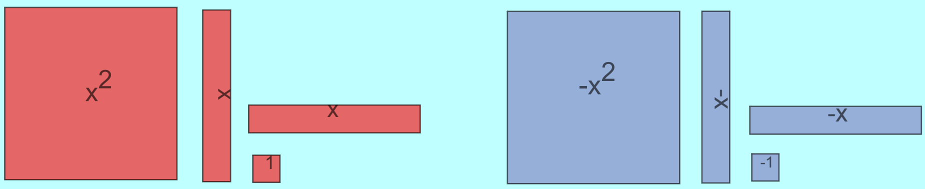
Apr. 1/2016

1. Using Alge-tiles or area model

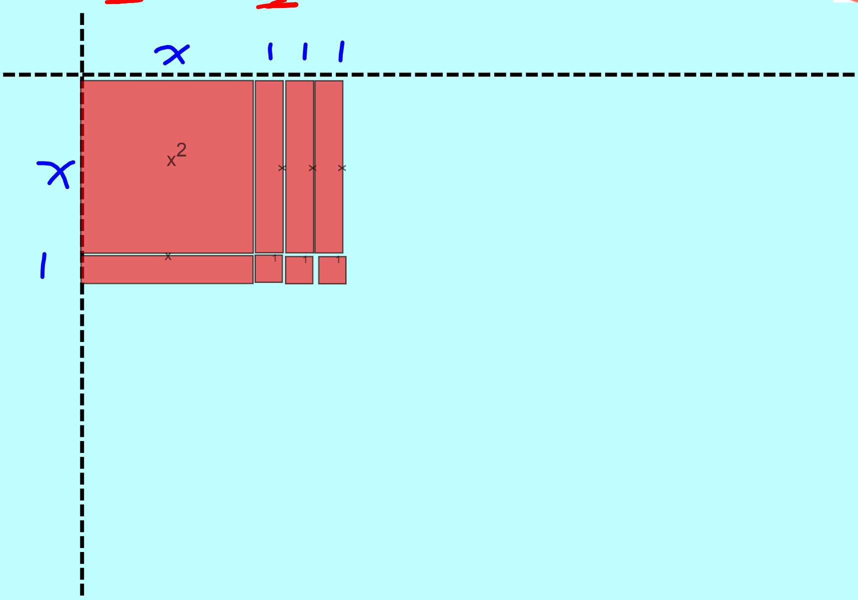
Model the expression as an area. The tiles must form a rectangle (or square).

The lengths of the sides are factors.

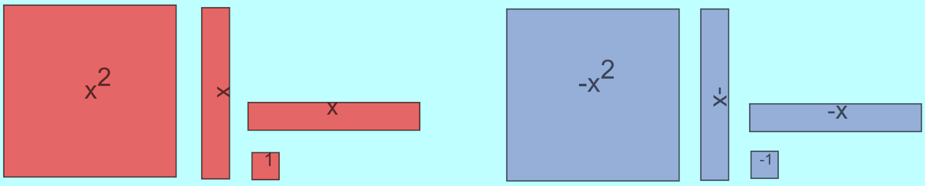
Mar 26-8:24 AM



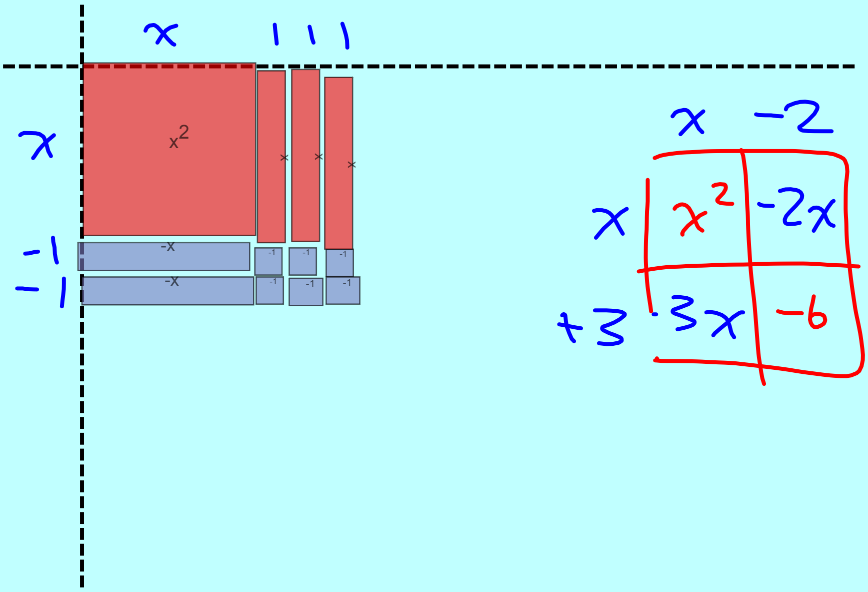
Factor: $x^2 + 4x + 3$ $= (x+3)(x+1)$



Mar 25-8:02 AM



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



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

Mar 25-8:02 AM

2. Algebraically

Consider: $(x + 2)(x + 3) = x^2 + 5x + 6$

What relationship is there between the factors and the coefficients of the answer?

2, 3 $\xrightarrow{?}$ 5, 6

$2 \times 3 = 6$ (product) $2 + 3 = 5$ (sum)

Mar 26-8:24 AM

Ex. Factor

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

Sum = 4

product = 3

$1 \times 3 = 3$

$1 + 3 = 4$

$x^2 + 4x + 3$

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

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

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

(b) $x^2 - 8x + 12$

$= (x-2)(x-6)$

S = −8

P = +12

I =

-1×-12 ✗

-2×-6 ✓

-3×4 ✗

~~4×3~~

Mar 30-9:10 PM

Ex. Factor $x^2 + x - 6$ using an area model.

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

S = 1

→ P = −6

I = -1×6

-2×3 ✓

~~3×2~~

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

or

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

Mar 22-7:35 PM

Assigned Work:

p.211 # 2, 4
(6, 7, 8)(ace)
9ace (look for common factors first)
12ace, 13ac

9(e) x^3+5x^2+4x

$= x(x^2+5x+4)$

S 5
P 4
I 1, 4

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

$= x[x(x+1)+4(x+1)]$

$= x[(x+1)(x+4)]$

$= x(x+1)(x+4)$

Mar 26-9:06 AM

12(e) x^3-3x^2-10x

$= x(x^2-3x-10)$

S −3
P −10
I

$= x(x^2+2x-5x-10)$

1 × 10 −9
2 × 5 −3 ✓
~~5 × 2~~

$= x[x(x+2)-5(x+2)]$

$= x(x+2)(x-5)$

Apr 4-1:59 PM

13.(c) $y = x^2 - 8x + 15$ S -8, P 15, I $-3, -5$

(i) $y = (x-3)(x-5)$

(ii) zeroes ⟷ x-intercepts ⟷ roots

Set $y = 0$

$0 = (x-3)(x-5)$

$x - 3 = 0$ $x - 5 = 0$

$x = 3$ $x = 5$

(iii) $x_v = x_m = \frac{3+5}{2}$

$= 4$

for y_v, sub $x_v = 4$

$y = (4-3)(4-5)$

$= -1$

$\therefore V(4, -1)$

Apr 4-2:03 PM