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

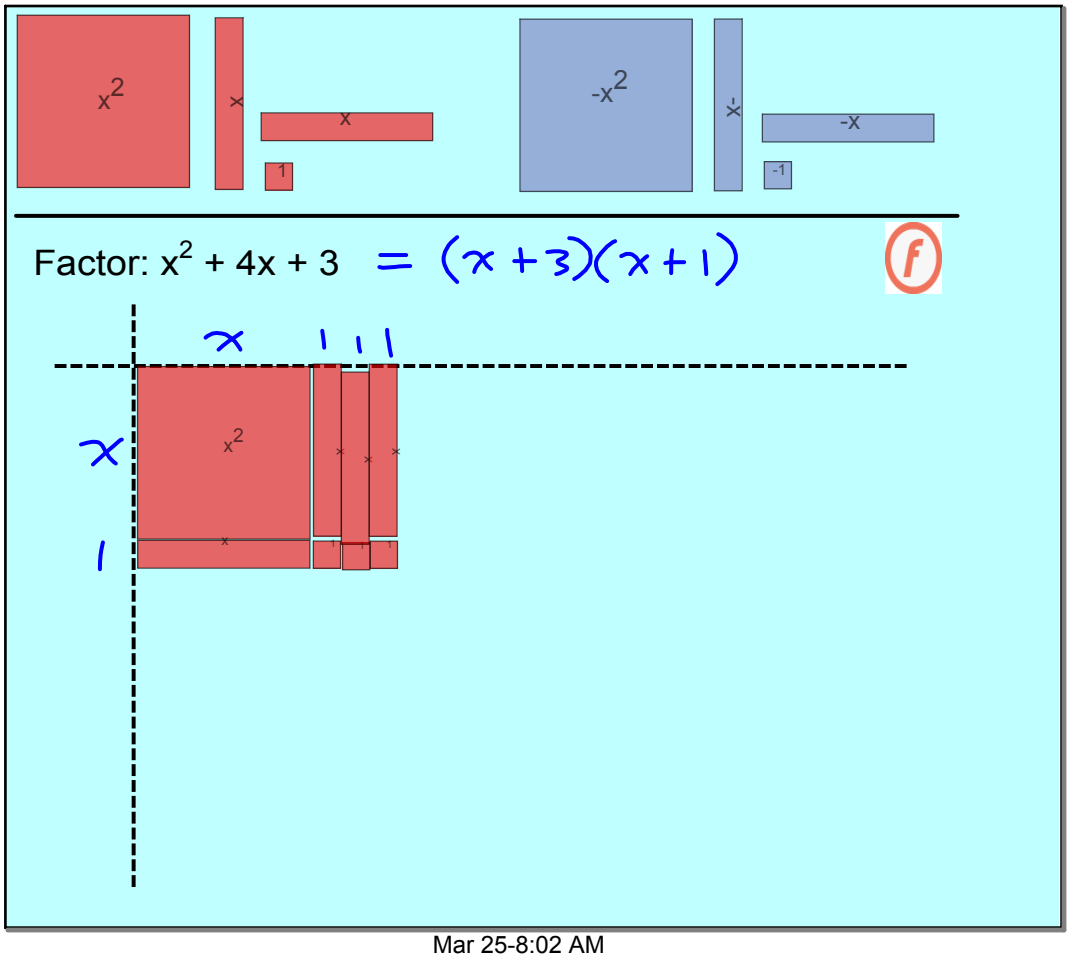
Apr. 1/2016

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



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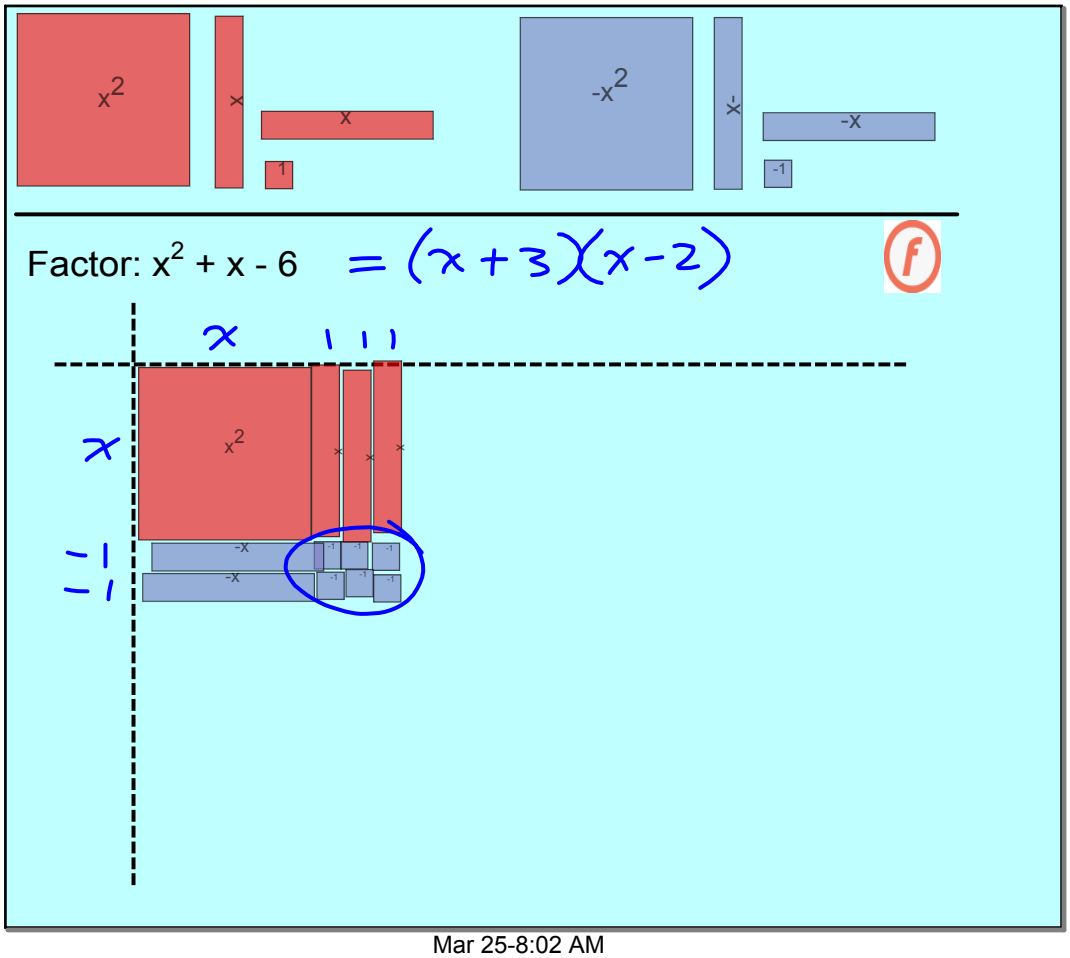

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2. Algebraically

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

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

$2 \times 3 = 6$ $2 + 3 = 5$

product Sum

2×3
1×6
$(-2) \times (-3)$
$(-1) \times (-6)$

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Ex. Factor

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

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

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

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

Sum = 4

→ Product = 3

Integers 1, 3

1 x 3	4
-1 x -3	-4

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Ex. Factor

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

$= x^2 - 6x - 2x + 12$

$= 1x(x-6) - 2(x-6)$

$= xa - 2a$

$= a(x-2)$

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

P = 12	S = -8
-12 x -1	-13 x
-6 x -2	-8 ✓
-4 x -3	-7 x
~~3 x 4~~	

I: -6, -2

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

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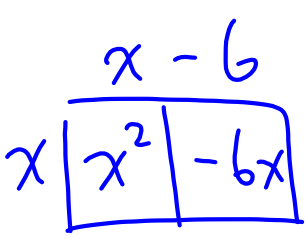
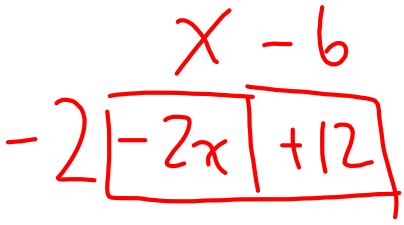
Assigned Work:

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



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



$-2x + 12 = -2(x-6)$

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8(c) $1a^2 - 1a - 56$

$S = -1$

$P = -56$

$= a^2 + 7a - 8a - 56$

$= a(a+7) - 8(a+7)$

$= (a+7)(a-8)$

1×-56

2×-28

4×-14

7×-8

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9 ce

(c) $3v^2 + 9v + 6$

$= 3(v^2 + 3v + 2)$

$= 3(v^2 + v + 2v + 2)$

$= 3[v(v+1) + 2(v+1)]$

$= 3[1(v+1)(v+2)]$

$= 3(v+1)(v+2)$

$S = 3$

$P = 2$

$I = 1, 2$

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

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

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

$= x^2[x(x+1) + 4(x+1)]$

$= x^2(x+1)(x+4)$

$S = 5$

$P = 4$

$I = 1, 4$ ✓

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13(c) $y = \underbrace{x^2 - 8x + 15}_{\text{factor}}$

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

$S = -8$

$P = 15$

$I = -3, -5$

for zeroes (x-ints), set $y = 0$

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

$x - 3 = 0$ $\quad x - 5 = 0$

$x = 3$ $\quad x = 5$

$x_v = \frac{3+5}{2}$

$= 4$

sub $x = 4$

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

$= -1$

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