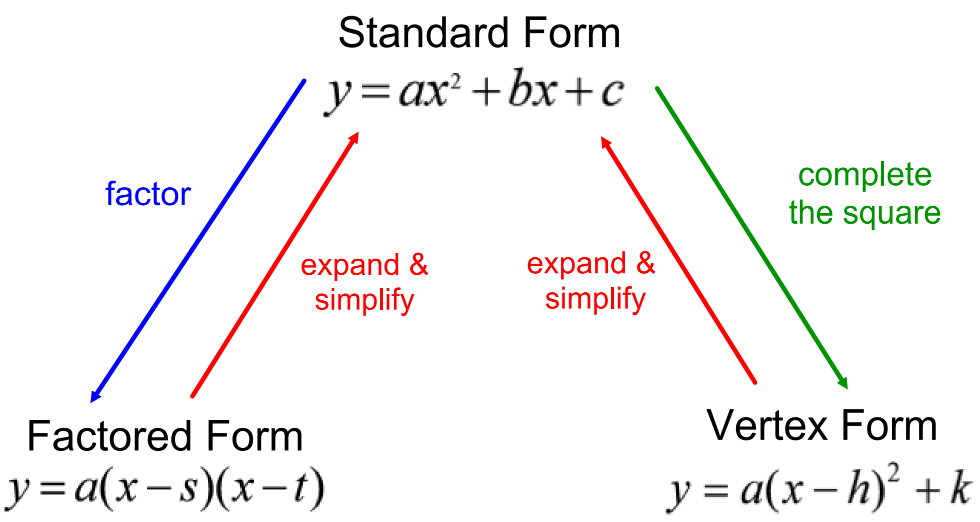
Feb 3/2011

# Review - Part 3

## Factoring Quadratic Relations

Jan 31-2:27 PM



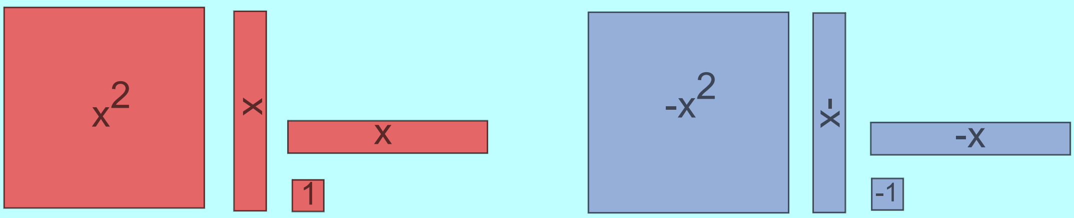

Feb 2-6:19 PM

## Common Factors

Always look for common factors first!

1. Factoring using tiles - form identical groups
2. Factoring by common factors
3. Factoring by grouping

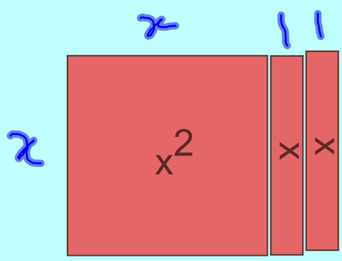
Feb 3-9:02 AM

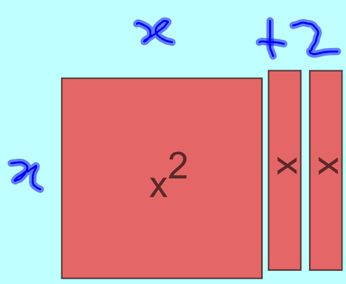



Factor: $2x^2 + 4x$

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

$= 2x(x+2)$




Mar 25-8:02 AM

2. Factor Algebraically

Look for the greatest common factor of the coefficients and the GCF of the variables.

Ex. Factor: $8x^3 - 6x^2y^2 + 4x^2y$

$$\frac{\cancel{x}\cdot\cancel{x}\cdot x}{\cancel{x}\cdot\cancel{x}} = x$$

The GCF of 8, 6, and 4 is 2.

The GCF of $x^3$, $x^2y^2$, and $x^2y$ is $x^2$.

$\frac{8x^3}{2x^2} - \frac{6x^2y^2}{2x^2} + \frac{4x^2y}{2x^2}$ $= 2(4x^3 - 3x^2y^2 + 2x^2y)$

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

Mar 26-8:24 AM

3. Factoring by Grouping

Some polynomials do not have common factors in all terms. They can sometimes be factored by grouping terms with common factors.

Ex. Factor: $ac + bc + ad + bd$

$= c\underbrace{(a+b)}_{x} + d\underbrace{(a+b)}_{x}$ let $x = a+b$

$= cx + dx$

$= x(c+d)$

$= (a+b)(c+d)$

Mar 26-8:24 AM

## Factoring Simple Trinomials ($x^2 + bx + c$) or Complex Trinomials ($ax^2 + bx + c$)

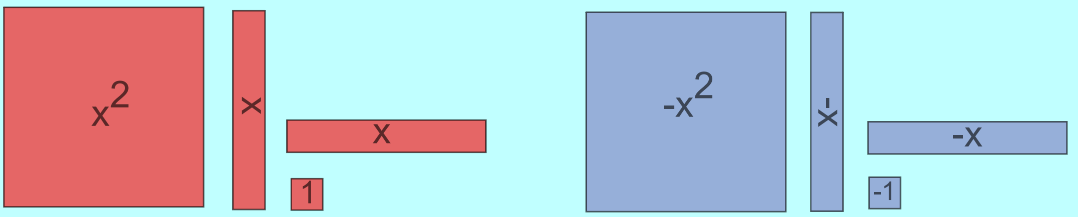
1. Using Alge-tiles, or an Area Model

   Model the expression as an area. The tiles must form a rectangle (or square). The lengths of the sides are factors.

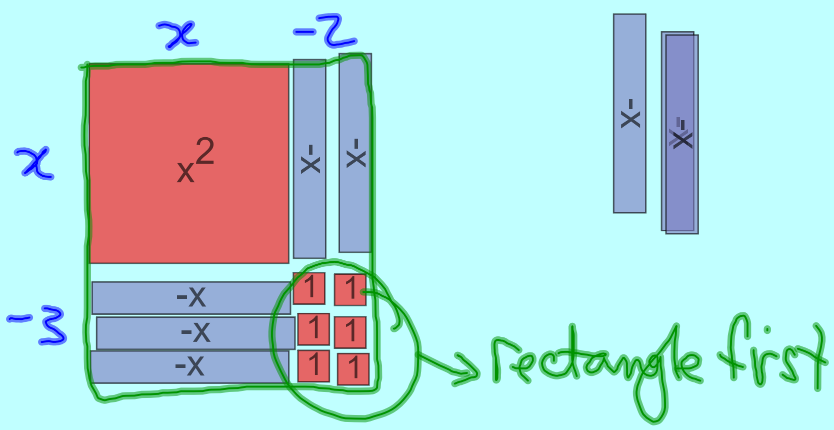
2. Algebraically

   What is the relationship between the coefficients of each term in the expression? Use this information to decompose the middle term into two pieces, then factor by grouping.

Mar 26-8:24 AM




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




Mar 25-8:02 AM

Factor: $x^2 - 5x + 6$

algebraically

product 6
sum −5

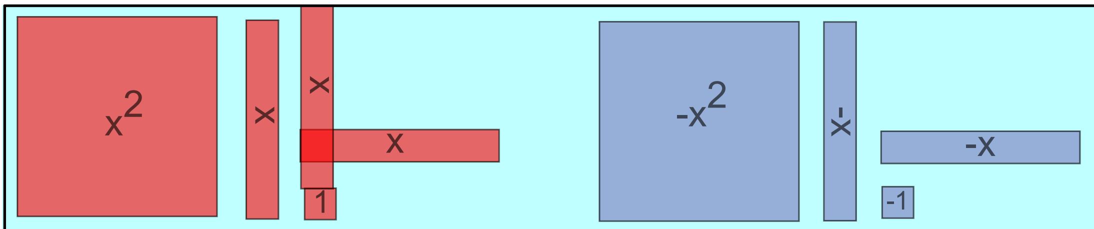
$-2, -3$

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

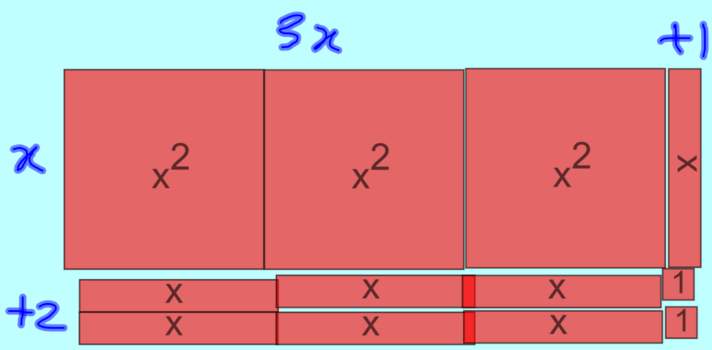
using an area model

| | $x$ | $-3$ |
|---|---|---|
| $x$ | $x^2$ | $-3x$ |
| $-2$ | $-2x$ | $6$ |

Feb 1-7:13 PM




Factor: $3x^2 + 7x + 2$ $= (x+2)(3x+1)$




Mar 25-8:02 AM

Factor $3x^2 + 7x + 2$ algebraically

S

$\times$ P

S : +7

P : +6

I : 1, 6

1, 6 ✓

2, 3 ✗

Sum, product
integers

$3x^2 + 7x + 2$

decompose using integers

$= \underbrace{3x^2 + x} + \underbrace{6x + 2}$ factor by grouping

$= x(\underline{3x+1}) + 2(\underline{3x+1})$ factors should be the same!

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

Feb 1-7:13 PM

Factor $3x^2 + 7x + 2$ using an area model

| | $x$ | |
|---|---|---|
| $3x$ | $3x^2$ | |
| | | $2$ |

Feb 1-7:13 PM

Factoring Special Quadratics (by patterns)

Perfect Squares: $a^2 + 2ab + b^2 = (a+b)^2$

$a^2 - 2ab + b^2 = (a-b)^2$

Difference of Squares: $a^2 - b^2 = (a-b)(a+b)$

(a) $25d^2 - 144$

$= (5d-12)(5d+12)$

(b) $16x^2 + 24xy + 9y^2$

$= (4x+3y)^2$

(c) $18p^2q - 60pq + 50q$

$= 2q(9p^2 - 30p + 25)$

$= 2q(3p-5)^2$

(d) $98a^2 - 32b^2$

$= 2(49a^2 - 16b^2)$

$= 2(7a-4b)(7a+4b)$

Feb 2-6:44 PM

Homework:

p.3 # 4odd, 5odd, 6odd

4ace...

5ace...

6ace...

Feb 1-7:30 PM

p.3 #6(k)

$3x^2+7x-20$

S: 7
P: −60
I: 12, −5

$= 3x^2+12x-5x-20$

$= 3x(x+4)-5(x+4)$

$= (x+4)(3x-5)$

Feb 4-9:08 AM

6(c)

S −11
P −60
I −15, 4

$3t^2-11t-20$

$= 3t^2-15t+4t-20$

$= 3t(t-5)+4(t-5)$

$= (t-5)(3t+4)$

Feb 4-9:11 AM

6(g)

$9a^2 - 16$

$= (3a-4)(3a+4)$

S: 0
P: -144
I: 12, -12

$= 9a^2 + 12a - 12a - 16$

$= 3a(3a+4) - 4(3a+4)$

$= (3a+4)(3a-4)$

Feb 4-9:12 AM