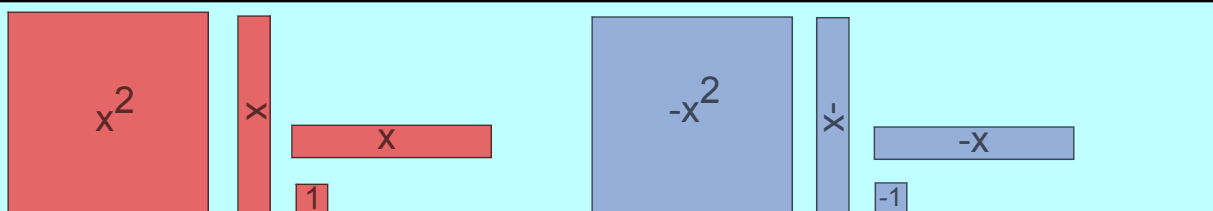


Factoring Complex Trinomials ($ax^2 + bx + c, a \neq 1$)

Mar 26-8:24 AM



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

Mar 25-8:02 AM

Factor: $2x^2 - 5x + 3$

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

$2x$ -3

x x^2 x^2 x x x x

$+1$ x x -1 -1 -1 -1

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Factoring Complex Trinomials ($ax^2 + bx + c$, $a \neq 1$) *Oct 28/2011*

Expand $(x + 4)(2x + 3)$. What are the x-terms?

$$\begin{aligned}(x + 4)(2x + 3) &= 2x^2 + 3x + 8x + 12 \\ &= 2x^2 + 11x + 12\end{aligned}$$

To factor $2x^2 + 11x + 12$, we need to do these steps in reverse order.

How do the numbers 3 and 8 relate to 2, 11, and 12?

$$\begin{aligned}3 + 8 &= 11 & 3 \times 8 &= 2 \times 12 = 24 \\ 3 \times 8 &= 2 \times 12\end{aligned}$$

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Once you have broken the middle term, you can factor by grouping

$$\begin{aligned}2x^2 + 11x + 12 &= \underbrace{2x^2 + 3x}_{a} + \underbrace{8x + 12}_{4a} \\ &= \underbrace{x(2x+3)}_a + \underbrace{4(2x+3)}_{4a} \\ &\quad \text{keep sign a between} \\ &= xa + 4a \\ &= a(x+4) \\ &= (2x+3)(x+4)\end{aligned}$$

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Ex. Factor $6m^2 + 13m - 5$

Numbers add to: +13 (sum)

Numbers multiply to: -30 (product)

Numbers are:

15 and -2 (integers)

This technique is called SPI
(sum, product, integers)

Product of	Sum

Apr 3-8:57 PM

Ex. Factor $6m^2 + 13m - 5$

Numbers are: **-2** and **15**

Now factor by grouping:

$$\begin{aligned}
 6m^2 + 13m - 5 &= \underbrace{6m^2 - 2m}_{2m(3m-1)} + \underbrace{15m - 5}_{5(3m-1)} \\
 &= 2m(3m-1) + 5(3m-1) \\
 &= (3m-1)(2m+5)
 \end{aligned}$$

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Ex. Factor: $10x^2 - 11x - 6$

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Assigned Work:

p.223-224 #3bc, 4bc, 5abc, 6,
#7abc, 11, 15, 17(Challenging)

Look for common factors first!!!

Mar 26-9:06 AM

6(e)

$$5d^2 + 8 - 14d$$

$$= 5d^2 - 14d + 8$$

S: -14

P: 40

I: -4, -10

$$= 5d^2 - 4d - 10d + 8$$

$$= d(5d - 4) - 2(5d - 4)$$

$$= (5d - 4)(d - 2)$$

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7(a)

$$15x^2 + 4x - 4$$

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

$$= 3x(5x - 2) + 2(5x - 2)$$

$$= (5x - 2)(3x + 2)$$

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

$$= 5x(3x + 2) - 2(3x + 2)$$

$$= (3x + 2)(5x - 2)$$

S 4

P -60

I

~~-1 60 59~~

~~-2 30 28~~

~~-3 20 17~~

~~-4 15 11~~

~~-5 12 7~~

-6 10 4

~~-10 6~~

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17(a)

$$6(a+b)^2 + 11(a+b) + 3$$

let $x = a+b$

$$= 6x^2 + 11x + 3$$

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