Lesson 3:Factoring Quadratics when a= 1

Quadratics in the form $x^2 + bx + c$

$$y = a(x - r)(x - s)$$

When we're factoring quadratics, we create two factors: (x +/- r) and (x +/- s)

***r* + *s* = b and *r* x *s* = c** **(in this case, r and s are integers)**

Some trends to watch for:
- If b and c are both positive, then: (x+r)(x+s)
- If b and c are both negative, then: (x-r)(x+s), but r > s
- If b is positive and c is negative, then: (x+r)(x-s), where r>s
- If b is negative and c is positive, then (x-r)(x-s)

*** If there is a common factor, first divide it out!**

Ex1 use the constant (c) and coefficient (b) to factor:

ax^2+bx+c

$x^2+10x+24$

$=(x+4)(x+6)$

$=x^2+6x+4x+24$

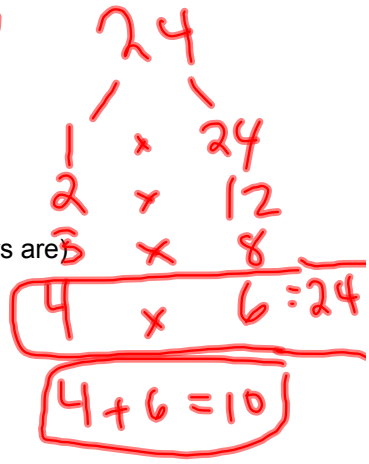
$=x^2+10x+24$

Both b and c are positive, so:

Both r and s are also positive.

To find r and s you need two numbers that add to: 10

and multiply to: 24



Try using the acronym M A N (**M**ultiply to equal "c", **A**dd to equal "b", the **N**umbers are)

M: 24

A: 10

N: 4 and 6

Ex 2:Factor out the GCF first, before factoring the quadratic

a) $6x^3 - 42x^2 - 48x$

$= 6x(x^2 - 7x - 8)$

$= 6x(x-8)(x+1)$

* don't forget to find the **GCF** first and take it out!

M : -8

A : -7

N : -8 , 1

-8

$(-8)\ (+1)$

Check by expanding:

$6x(x-8)(x+1)$

$= 6x(x^2 + 1x - 8x - 8)$

$= 6x(x^2 - 7x - 8)$

$= 6x^3 - 42x^2 - 48x$

b) $4x^3 - 8x^2 - 60x$

$= 4x(x^2 - 2x - 15)$

-2

-15

$-15 + 1 = -14$

$-5 + 3 = -2$

$\therefore y = 4x(x-5)(x+3)$

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