Factoring Trinomials: $x^2 + bx + c$ (5.4) **Math 098**

Let's observe the patterns:

$$(x+3)(x+4)$$

So to factor $x^2 + bx + c$ we look for two numbers that _______________________ to ____ and _______________________ to _____.

Example 1: Factor

a.) $x^2 + 9x + 20$

b.) $t^2 - 12t + 32$

So if *c* is positive, then the two numbers have _______________________._______________________., and *b* determines it.

Example 2: Factor

a.) $r^2 + 5r - 36$

b.) $q^2 - 3q - 40$

So if *c* is negative, then the two numbers have ____, and

b will determine which sign will be "_______________________" (that is, have more absolute value or weight).

Important: When factoring always factor out the __________ first.

Example 3: Factor completely

a.) $x^3 + 3x^2 - 4x$

b.) $y^2 + 6y + 15$

Example 4: Factor completely

a.) $a^2 - 2ab - 48b^2$

b.) $2t^2 + 32t - 72$

Example 5: Solve

a.) $x^2 - 5x - 6 = 0$

b.) $(z+4)(z-2) = -5$

c.) $2x^5 = 26x^3 - 72x$ (graph (c.) when done to observe the roots/zeros. Use the window $[-5,5]\times[-75,75]$)

Example 6: Write a polynomial function $f(x)$ in standard form whose zeros are -3, 0, and 4.

Example 7: Practice for you (factor or solve as appropriate)

a.) $x^2 + 5x + 6$

b.) $x^2 - 5x - 6$

c.) $x^2 - 5x + 6$

d.) $x^2 + 5x - 6$

e.) $3r^3 = 45r^2 + 48r$

f.) $r^3 - 3r^2 = 4r - 12$