

Factoring Trinomials

Goal: To factor degree 2 polynomials of the form $ax^2 + bx + c$

ex Factor ($a=1$)

a) $x^2 + 7x + 12$

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

Reverse FOIL

$a=1, b=7, c=12$

$x^2 + bx + c$

method

To get the last multipliers, find two #'s whose product is c and whose sum is b .

b) $2y^2 - 2y + 12$

GCF → $2(y^2 - y + 6)$
 ~~$2(y - 2)(y + 3)$~~

$2(y^2 - y + 6)$

* factor out GCF first!

Note: $y^2 - y + 6$ is called prime because it doesn't factor

c) $15 - 2x - x^2$

$-x^2 - 2x + 15$

$-1(x^2 + 2x - 15)$

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

$$\left. \begin{array}{l} (-x+3)(x+5) \\ (3-x)(x+5) \\ (x+5)(3-x) \end{array} \right\} \text{equivalent}$$

$$\star d) m^2 - 2mn - 63n^2$$

$$(m + 7n)(m - 9n)$$

$$(m + 7n)(m - 9n)$$

$$-9mn + 7mn \checkmark$$

$$(m+7n)(m-9n)$$

ex) Factor ($a \neq 1$)

\star Use trial and error to reverse foil.

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

~~$(3x + 2)(x - 2)$~~

$(3x - 4)(x + 1)$ ✓

$(3x - 4)(x + 1)$

$a=3, b=-1, c=-4$

FOIL

Get possible first and last multipliers and then multiply outer and inner terms and check to see if you get the right middle term in the original trinomial.

b) $18x^2 - 3x - 10$

$(6x - 5)(3x + 2)$

$(6x - 5)(3x + 2)$

c) $144x^5 + 168x^4 + 48x^3$

$24x^3(6x^2 + 7x + 2)$

$24x^3(3x + 2)(2x + 1)$ ✓

$$24x^3(3x+2)(2x+1)$$