

5.5C More on AntiFOIL

A. Discussion

1. Trinomials that are not necessarily of the form $ax^2 + bx + c$ can still usually be factored using AntiFOIL. Just do the logical thing.
2. When factoring any trinomial, you should factor out the GCF first (if there is one).

B. Examples

Example 1: Factor $2x^2 - 7xy + 3y^2$.

Solution

NO GCF!

$$\frac{2x^2 - 7xy + 3y^2}{2x^2 - xy - 6xy + 3y^2} \left| \begin{array}{l} \boxed{6} \\ 6 \sqrt{} \end{array} \right. \text{TSP: } -, -$$

Now factor by grouping!

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

Ans $\boxed{(2x - y)(x - 3y)}$

Example 2: Factor $6x^3y + 22x^2y^2 - 40xy^3$.

Solution

First factor out the GCF: $2xy(3x^2 + 11xy - 20y^2)$

Now factor the trinomial on the inside using AntiFOIL

$3x^2 + 11xy - 20y^2$	$\boxed{-60}$	TSP: +, -
$3x^2 + 12xy - xy - 20y^2$	-12	
$3x^2 + 13xy - 2xy - 20y^2$	-26	
$3x^2 + 14xy - 3xy - 20y^2$	-42	
$3x^2 + 15xy - 4xy - 20y^2$	-60	✓

Factoring by grouping, we get $3x(x + 5y) - 4y(x + 5y)$.

$$\text{Hence } 3x^2 + 11xy - 20y^2 = (x + 5y)(3x - 4y)$$

$$\text{Thus } 2xy(3x^2 + 11xy - 20y^2) = 2xy(x + 5y)(3x - 4y)$$

Ans $\boxed{2xy(x + 5y)(3x - 4y)}$