

### Deciding the Signs for Factoring Trinomials

The first step is to take a look at the second sign in the trinomial. This sign tells you whether the factored signs are the same or opposite.

**IF** the second sign in the trinomial is positive than the factored signs are the same (either both positive or both negative).

- if the first sign in the trinomial is **positive** than both factored signs are positive.

○ Ex.	$20x^2 + 23x + 6$	<b><math>20x^2</math></b>	<b>6</b>
		$1x \cdot 20x$	$1 \cdot 6$
	$(4x + 3)(5x + 2)$	$2x \cdot 10x$	$2 \cdot 3$
		$4x \cdot 5x$	

- if the first sign in the trinomial is **negative** than both factored signs are negative.

○ Ex.	$20x^2 - 23x + 6$
	$(4x - 3)(5x - 2)$

**IF** the second sign in the trinomial is negative than the factored signs are opposite (one is negative and one is positive).

- if the first sign in the trinomial is **positive** than the larger term between the inner and outer FOIL terms is also positive.

○ Ex.	$3y^2 + 7y - 20$	<b><math>3y^2</math></b>	<b>20</b>
		$1y \cdot 3y$	$1 \cdot 20$
	$(3y - 5)(y + 4)$		$2 \cdot 10$
			$4 \cdot 5$

Outer term is  $3y \cdot 4 = 12y$

Inner term is  $5 \cdot y = 5y$

So,  $12y$  is the larger term and is gets the positive sign

$(3y - 5)(y + 4)$

- if the first sign in the trinomial is **negative** than the larger term between the inner and outer FOIL terms is also negative.

○ Ex.	$3y^2 - 7y - 20$
	Outer term is $3y \cdot 4 = 12y$
	Inner term is $5 \cdot y = 5y$
	So, $12y$ is the larger term and is gets the negative sign
	$(3y + 5)(y - 4)$

**\*Hint** A lot of the time the factors that are closest together on the number line are the correct choice (such as  $4x$  times  $5x$  to make  $20x^2$  and  $2$  times  $3$  to make  $6$ ).