Factoring Complex Trinomials
Problem type: $ax^2 + bx + c$ (Where a, b and c are numbers, and x is the unknown.)

Rules for signs: Use the same sign rules for all trinomials
Rule 1: If the <u>2nd **sign is +**</u>, then both factor signs will match the <u>**1st sign**</u> in the problem.
$ax^2 + bx + c \rightarrow ($ **+** $)($ **+** $)$ $ax^2 - bx + c \rightarrow ($ **-** $)($ **-** $)$

Rule 2: If the <u>2nd **sign is -**</u>, then the factor signs will be different, + and -.
$ax^2 + bx - c \rightarrow ($ **+** $)($ **-** $)$ $ax^2 - bx - c \rightarrow ($ **+** $)($ **-** $)$

Rule 3: Use 2nd operation to find out if you add or subtract factors to equal b.

Steps to remember:
1. Set the factor statement
2. Set the binomial factors with the signs
3. Factor the variable squares
4. Find all factor combinations for "a" and "c" until one matches the factor statement
5. Place the "a" factors in the 1st positions and the "c" factors in the 2nd positions of the binomial pairs
6. FOIL to check

Example 1: $25x^2 - 20x + 4$	Step 1: Factor Statement:
( ) ( )	Step 2: Set signs for the factors.
	Step 3: Factor the variable squares.
	Step 4: Factor a; factor and reverse factor c a = _____ c = _____ *Factor Statement Work Space* _____ _____ _____ _____ _____ _____ Look for the combination that fits the factor statement.
	Step 5: Use the "a" factors in the 1st positions and the "c" factors in 2nd positions of your solution.
	Step 6: FOIL to check.

Factoring Complex Trinomials, page 2

Example 2: $20x^2 + 27x - 8$	Step 1: Factor Statement:
( ) ( )	Step 2: Set signs for the factors.
	Step 3: Factor the variable squares.
	Step 4: Factor a; factor and reverse factor c $a =$ _____ $c =$ _____ *Factor Statement Work Space* _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ Look for the combination that fits the factor statement.
	Step 5: Use the "a" factors in the 1st positions and the "c" factors in 2nd positions of your solution.
	Step 6: FOIL to check.

Example 3: $2x^2 + 17x + 10$	Step 1: Factor Statement:
( ) ( )	Step 2: Set signs for the factors.
	Step 3: Factor the variable squares.
	Step 4: Factor a; factor and reverse factor c $a =$ _____ $c =$ _____ *Factor Statement Work Space* _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ Look for the combination that fits the factor statement.
	Step 5: Use the "a" factors in the 1st positions and the "c" factors in 2nd positions of your solution.
	Step 6: FOIL to check.

Factoring Complex Trinomials, page 3

Example 4: $6x^2y^2 - 2xy^2 - 60y^2$	Step 1: Factor Statement:
	Step 2: Set signs for the factors.
	Step 3: Factor the variable squares.
	Step 4: Factor a; factor and reverse factor c $a = $ _____ $c = $ _____ *Factor Statement Work Space* _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ _____ Look for the combination that fits the factor statement.
	Step 5: Use the "a" factors in the 1st positions and the "c" factors in 2nd positions of your solution.
	Step 6: FOIL to check.

Example 5: $-x^2 + 24x + 25$	Step 1: Factor Statement:
	Step 2: Set signs for the factors.
	Step 3: Factor the variable squares.
	Step 4: Factor a; factor and reverse factor c $a = $ _____ $c = $ _____ *Factor Statement Work Space* _____ _____ _____ _____ _____ _____ Look for the combination that fits the factor statement.
	Step 5: Use the "a" factors in the 1st positions and the "c" factors in 2nd positions of your solution.
	Step 6: FOIL to check.