Name _____ Class _____ Date _____

Reteaching 9-6

Factoring Trinomials of the Type $ax^2 + bx + c$

OBJECTIVE: Factoring trinomials of the type $ax^2 + bx + c$; $a > 1$

MATERIALS: None

A table can be helpful when factoring trinomials of the type $ax^2 + bx + c$.

Examples

Factor $2x^2 + 13x + 20$.

Write the first term in the top left box of the table. → $\begin{array}{|c|c|}\hline 2x^2 & \\ \hline & \\ \hline \end{array}$

Write the constant term in the bottom right box of the table. → $\begin{array}{|c|c|}\hline 2x^2 & \\ \hline & 20 \\ \hline \end{array}$

Find the product ac. → Since $a = 2$ and $c = 20$, $ac = 40$.

Find two numbers whose product is ac and sum is b. → Since $ac = 40$ and $b = 13$, the numbers are 8 and 5.

These numbers are the coefficients of the x terms that are written in the remaining boxes of the table. →

$$\begin{array}{|c|c|}\hline 2x^2 & 8x \\ \hline 5x & 20 \\ \hline \end{array}$$

(Note: Try repeating these steps, exchanging the locations of $5x$ and $8x$.)

Now, find the greatest common factors of the terms in each row and column. Write these above and to the left of the table. →

	x	4
$2x$	$2x^2$	$8x$
5	$5x$	20

Read across the top of the table to find one factor. → $x + 4$

Read down the left of the table to find the other factor. → $2x + 5$

So, $2x^2 + 13x + 20 = (x + 4)(2x + 5)$.

You can check your answer using FOIL.

Factor $3x^2 - 2x - 8$.

$ac = 3(-8) = -24$

$b = -2$

The numbers whose product is -24 and sum is -2 are -6 and 4. Write $-6x$ and $4x$ in the table and find the GCFs of each row and column.

	$3x$	4
x	$3x^2$	$4x$
-2	$-6x$	-8

$3x^2 - 2x - 8 = (3x + 4)(x - 2)$.

Exercises

Factor each expression.

1. $2x^2 + 11x + 14$
2. $4x^2 - 12x + 5$
3. $6x^2 - 13x + 2$
4. $6x^2 + 7x - 20$
5. $3x^2 + 4x - 4$
6. $8x^2 - 13x - 6$
7. $2x^2 - 5x + 3$
8. $5x^2 - 26x - 24$
9. $6x^2 - 7x - 3$
10. $6x^2 + 7x - 3$