Sec 3.6: Polynomials of the Form $ax^2 + bx + c$

$a \neq 1$

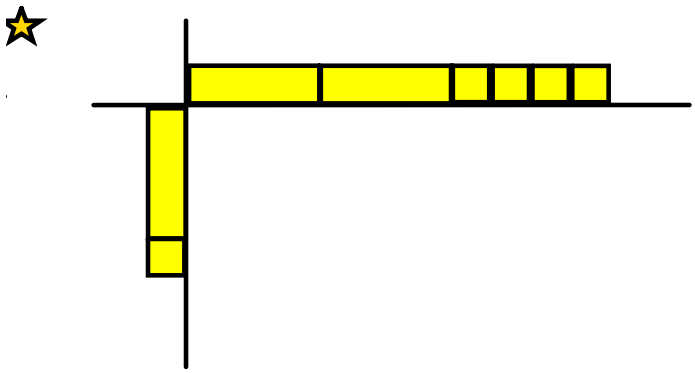
Extend the strategies to multiply and factor trinomials.

Example 1: Multiply

a) $(2x+4)(x+1)$

algebra tiles

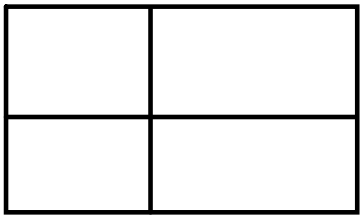
algebra



b) $(2x-1)(2x+2)$

rectangle model

algebra



Your Turn: Multiply the following using a method of your choice.

c) $(2x-4)(x-3)$

d) $(5h-7)(2h+3)$

e) $(3x-8)(4+2x)$

f) $(2x-5)(2x-5)$

g) $(2-3x)(3x-2)$

Work Book Questions	Extra Practice Questions
p.177 #5c, 8a, 9ace,10ace	p.177 #6b, 8bc, 9bdf,10bdf

Factoring $ax^2 + bx + c$

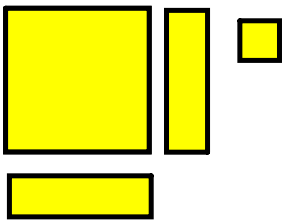
$$\downarrow$$

$$(\quad)(\quad)$$

Remember we are given the area of a rectangle and we want to find its dimensions.

Example 2: Using Algebra tiles factor the following polynomial

$$2x^2 + 5x + 3$$



How can we factor trinomials without a diagram, when $a \neq 1$?

How to factor a trinomial of the form $ax^2 + bx + c$ where $a \neq 1$

1. Decomposition
2. Rectangle Model
3. Logical Reasoning

Example 3: Factor $6h^2 + 11h + 4$

Use Decomposition

Step 1: multiply the coefficient of h^2 by the constant term.

Step 2: use the sum/product idea:

Step 3: rewrite the trinomial replacing the middle term

Step 4: Group the first two terms together and remove the GCF.
Group the second two terms together and remove the GCF.

Note: You can always verify your answer! Use FOIL.

Example 4: Factor using decomposition.

a) $3x^2 - 10x - 8$

b) $6x^2 - 21x + 9$

Always check for GCF first!

Your Turn: Factor the following

c) $2x^2 - 5x - 3$

d) $3n^2 + 17n + 10$

e) $4x^2 - 6x - 40$

Example 5: Factor $2x^2 - 11x + 5$

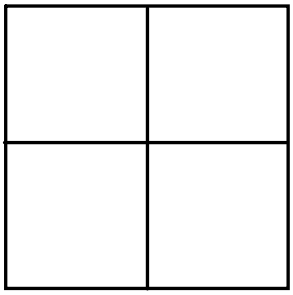
→ **Use Rectangle Model**

Important To Remember:
(1) Terms must be in Descending Order
(2) Must Factor out the GCF first

$2x^2 - 11x + 5$

Step 1: place first term in upper left,
last term in bottom right.

Step 2: Use sum/product like decomposition
to get the numbers to complete the diagonal.



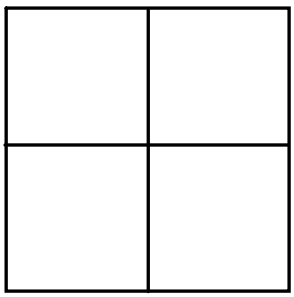
Step 3: Remove GCF from each column. Remove GCF from each row.

Step 4: the GCF of the columns and the rows are the factors of the trinomial.

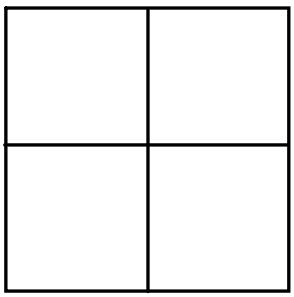
IMPORTANT: If first term is negative, ALWAYS remove a negative GCF

Example 6 Factor using the Rectangle Model.

a) $3x^2+11x+6$

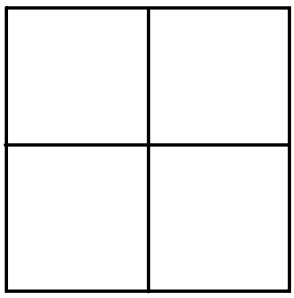


b) $6x^2-21x+9$

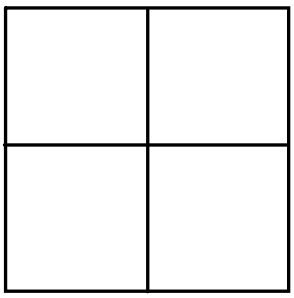


Your Turn: Factor the following

c) $4x^2-8x-5$



d) $30x^2-39x-9$



Example 7: Factor: $3x^2 + 16x + 5$

Use Logical Reasoning

Guess and Check!

Multiply to give 3

$(\_\_\_ + \_\_)(\_\_\_ + \_\_)$

Multiply to give 5

Work Book Questions	Extra Practice Questions
p.177-178 #13ace,15ace, 16ab, 18ab	p.177-178 #13bdf,14,15bdf,18cd, 19acegi