

Sec 3.5: Polynomial of the Form $x^2 + bx + c$

Multiplying Binomials →

$$(x + a)(x + b) = x^2 + bx + c$$

← Factoring Trinomials

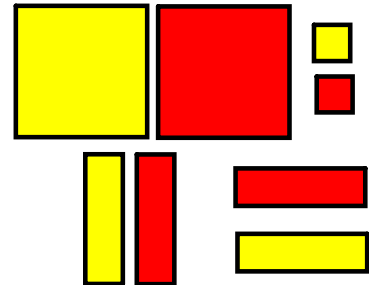
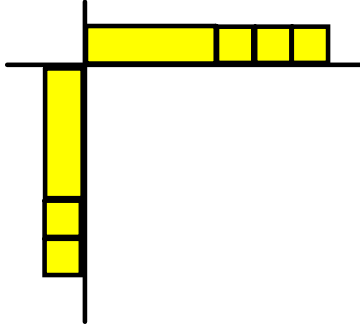
Multiply a Binomial by a Binomial

↳ Methods:

- (i) algebra tiles,
- (ii) rectangle model
- (iii) distributive property

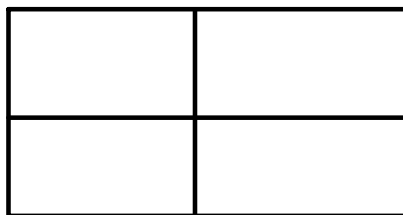
Example 1: Multiply $(x + 2)(x + 3)$

(i) Algebra Tiles



What do you notice about the two numbers in the resulting trinomial?

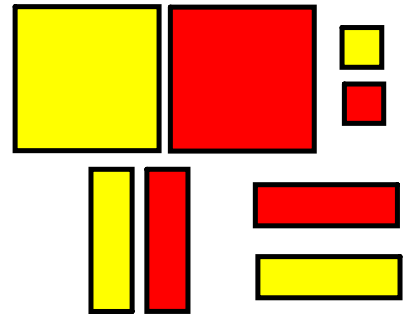
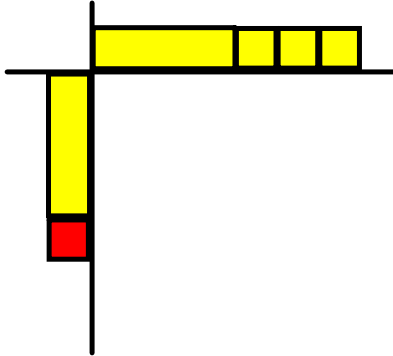
(ii) Rectangle Method $(x + 2)(x + 3)$



(iii) Distributive Method $(x + 2)(x + 3)$

Example 2: Multiply $(x + 3)(x - 1)$

(i) Algebra Tiles



(ii) Rectangle Method $(x + 3)(x - 1)$



(iii) Distributive Method $(x + 3)(x - 1)$

Example 3: Use the distributive property to multiply.

↳ Each term in the first binomial is multiplied by each term in the second binomial.

a.

b. $(p - 6)(p + 2)$

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

Think About

F _____

O _____

I _____

L _____

Your Turn

d.

e. $(x - 6)(x - 7)$

Work Book Questions

p.166-167 #4a, 10abc,
12a-e (multiply only), 13a

Extra Practice Questions

p.166 - 167 #4bc, 5b, 9b,
12fgh (multiply only)

Factoring Trinomials

↳ Factoring is the reverse operation for multiplying. We are given the area and asked to find the length and the width.



binomial factors

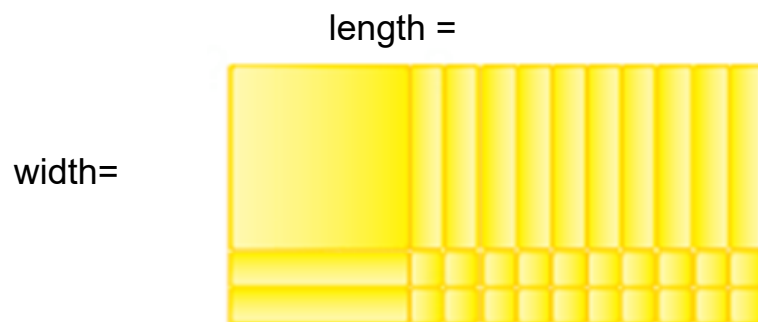
IDEA: To factor trinomials of the form

↳ leading numerical coefficient is 1

- Arrange the algebra tiles into a rectangle
- Find expressions for its length and width
- Write the length and width as factors of the trinomial

Example 4: Factor using algebra tiles.

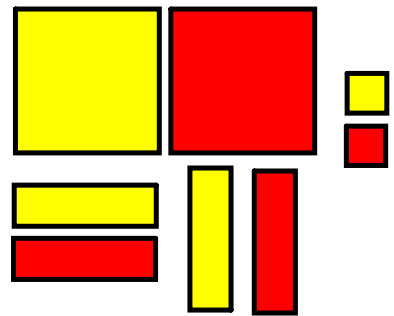
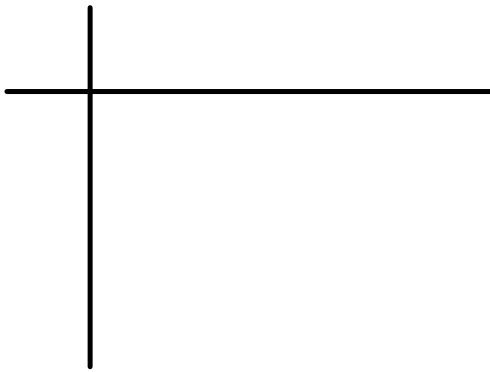
a.



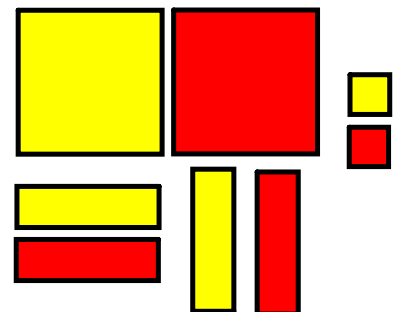
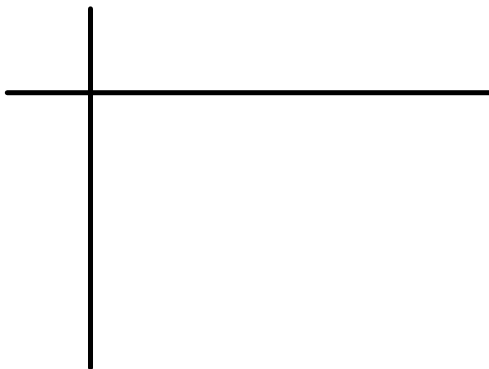
so $Area =$

Your Turn:

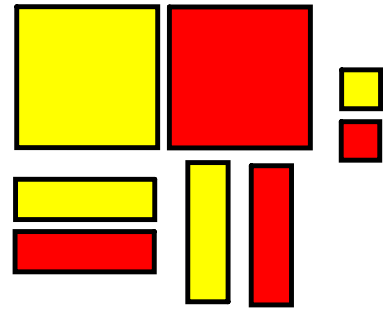
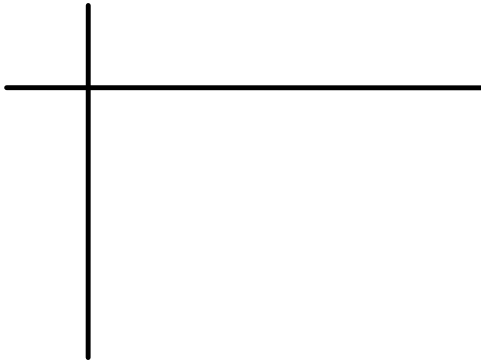
b. $x^2 + 5x + 4$



c. $x^2 + 6x + 8$

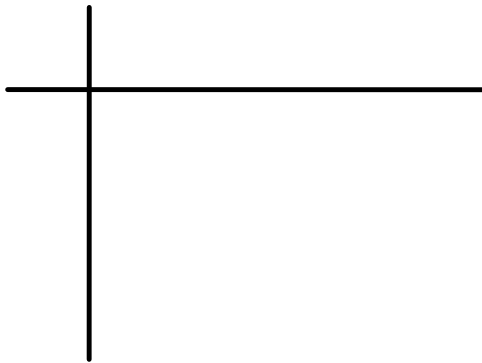


d. $x^2 + 4x + 4$



Challenge

e. $x^2 + 3x - 10$



Hint:
When factoring trinomials with negative terms using algebra tiles, Zero Principal must be used.

What do you notice?

- we can check using foil
- every polynomial had a coefficient of 1 in front of x^2
- the last term is the **product** of the numbers in each factor
- the middle term is the **sum** of the numbers in each factor

When a trinomial is written in this form:

$$\begin{array}{ccc}
 \mathbf{x^2 + bx + c} \\
 \uparrow \quad \uparrow \quad \uparrow \\
 \text{coefficient is 1} \quad \text{sum} \quad \text{product}
 \end{array}$$

Sum/Product Method

Example 5 Use sum/product method to factor the following:

a. $x^2 + 5x + 6$

b. $x^2 - 7x + 10$

Your Turn

c. $x^2 - 2x - 15$

d. $x^2 - 8x + 16$

e. $x^2 - 4x - 12$

f. $x^2 - 8x - 9$

g. $x^2 + 12x + 36$

Factoring a Trinomial using 2 skills:

- └→ (i) Remove the GCF
(ii) Use the sum/product

Example 6 Factor completely and verify your answer.

CHECK GCF FIRST

a. $2x^2 + 8x + 6$

Verify

b. $3x^2 - 12x - 36$

c. $2x^2 - 14x - 120$

d. $-8h^2 + 16h + 64$

Remember if the first term begins with a negative, we include the negative in the GCF.

Work Book Questions

p.166 - 167# 11aceg, 14aceg,
17ab, 19ab, 20ac, 21ace

Extra Practice Questions

p.166 - 167 #7, 14bdfh, 15ac,
19def, 20bdf, 21bdf, worksheet