

Correct Last Day's Homework: pp. 245-247 #1a, 2e, 3d, 4c, 6, 7ab, 11  
 Challenge: #14

Factoring Warm-up: *This part is not on the handout.*

a) List all the factors of 12

(This means list all the numbers that divide into 12 with no remainder)

2	6	1	12
3	4	2	6
1	12	3	4
		4	

b) List all the factors of 20

1	20
2	10
<del>3</del>	
4	5
5	

c) List all the factors of 30

1	30
2	15
3	10
<del>4</del>	
5	6

p. 245 76 y-int, let  $x=0$ 

$$\begin{aligned}
 y &= 10x^2 - 15x + 7 \\
 &= 10(0)^2 - 15(0) + 7 \\
 &= 0 - 0 + 7 \\
 &= 7
 \end{aligned}$$

p. 246 #11

$$y = -4.9x^2 + 6x + c$$

$$y = -4.9t^2 + \underline{v}t + h$$

$$a = -4.9$$

20 m  $\Rightarrow$  20 sec  $\rightarrow$  vertex  $(t, h)$ 

$$\left( \overset{h}{2}, \overset{k}{20} \right)$$

$$a) \cdot y = -4.9(t-2)^2 + 20$$

$$b) = -4.9(t-2)(t-2) + 20$$

$$= -4.9(t^2 - 2t + 2t + 4) + 20$$

$$= -4.9(t^2 - 4t + 4) + 20$$

$$= -4.9t^2 + 19.6t - 19.6 + 20$$

$$= -4.9t^2 + \underline{19.6t} + 0.4$$

c) Since  $v = 19.6$  $\therefore$  initial velocity is 19.6 m/s

d) max is 20m.

MBF3CI

# 5.3

## Factor Trinomials of the Form $1x^2 + bx + c$

### Today's Learning Goal(s):

By the end of the class, I will be able to:

- Expand** two simple binomials (in one step).
- List all the factors of any number.
- Factor** a trinomial.
- Understand how the "+" and "-" signs of a trinomial can help to determine its factors.

MBF 3CI 5.3 Factoring Trinomials of the form  $x^2 + bx + c$  (Day 1)Date: Nov. 11/16

"The Background"

Expand the following:

1)  $(x+3)(x+5)$

$$= x^2 + 5x + 3x + 15$$

$$= x^2 + 8x + 15$$

2)  $(x+5)(x+6)$

$$= x^2 + 6x + 5x + 30$$

$$= x^2 + 11x + 30$$

3)  $(x+2)(x+7)$

$$= x^2 + 7x + 2x + 14$$

$$= x^2 + 9x + 14$$

4)  $(x-4)(x-2)$

$$= x^2 - 6x + 8$$

5)  $(x-7)(x-3)$

$$= x^2 - 10x + 21$$

6)  $(x-2)(x-5)$

$$= x^2 - 7x + 10$$

Ex.1 Factor the following trinomials, where **last term is positive**, using the Product/Sum method:

1)  $x^2 + 8x + 15$

$$= (x+3)(x+5)$$

$$\begin{array}{r} 1 \quad 15 \\ 2 \\ 3 \quad 5 \\ * \end{array}$$

2)  $x^2 - 7x + 12$

$$= (x-3)(x-4)$$

$$\begin{array}{l} -1 - 12 = -13 \\ -2 - 6 = -8 \\ -3 - 4 = -7 \end{array}$$

3)  $x^2 - 22x + 40$

$$= (x-2)(x-20)$$

$$\begin{array}{r} 1 \quad 40 \\ 2 \quad 20 \\ 3 \\ 4 \quad 10 \\ 5 \quad 8 \\ 6 \\ 7 \end{array}$$

4)  $x^2 - 14x + 40$

$$= (x-4)(x-10)$$

5)  $x^2 - 13x + 40$

$$= (x-5)(x-8)$$

6)  $x^2 + 9x + 18$

$$= (x+3)(x+6)$$

7)  $x^2 + 3x + 2$

$$= (x+2)(x+1)$$

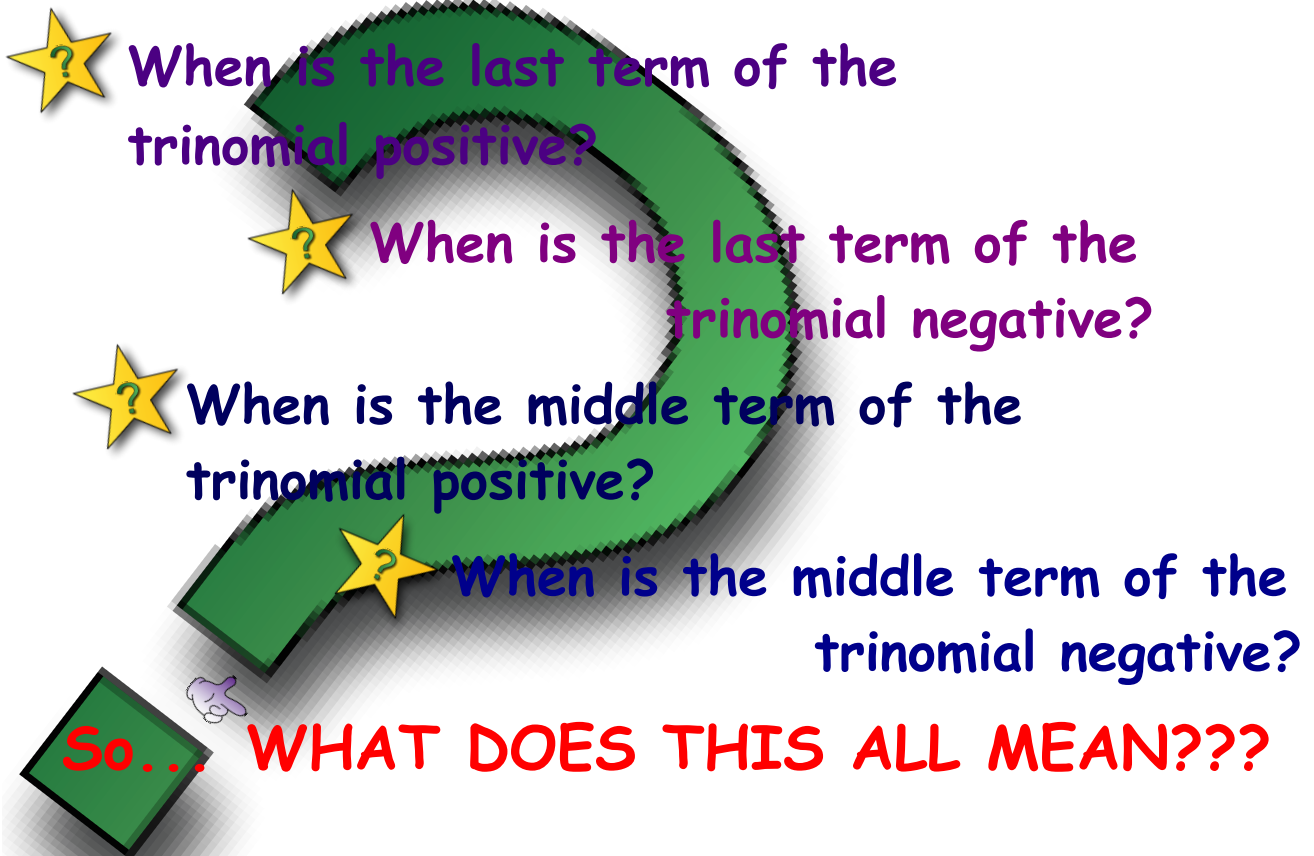
8)  $x^2 - 17x + 72$

$$= (x-8)(x-9)$$

9)  $x^2 + 5x + 2$

D.N.F.

$$\begin{array}{r} 1 \quad 72 \\ 2 \quad 36 \\ 3 \quad 24 \\ 4 \quad 18 \\ 6 \\ 8 \\ 9 \\ 12 \\ 18 \\ 24 \\ 36 \\ 72 \end{array}$$



**SUMMARY:**

When the **last term** is **POSITIVE**, the two factors have **the same** sign, and must **add** to get the middle term.

- The **middle sign** indicates the sign of **both factors**.

Ex.2 Factor the following trinomials, where the *last term is negative*, using the Product/Sum method:

$$\begin{array}{l}
 1) \ x^2 + 18x - 40 \\
 = (x + 20)(x - 2)
 \end{array}
 \quad
 \begin{array}{l}
 2) \ x^2 - 18x - 40 \\
 = (x + 2)(x - 20) \\
 \quad (x - 20)(x + 2)
 \end{array}
 \quad
 \begin{array}{l}
 3) \ x^2 + 6x - 16 \\
 = (x + 8)(x - 2)
 \end{array}$$

$  \begin{array}{l}  1 - 40 = -39 \\  2 - 20 = -18 \\  \cancel{3} \\  4 - 10 \\  5 - 8  \end{array}  $	$  \begin{array}{l}  1 \quad 16 \\  2 \quad 8 \\  \cancel{3} \\  4 \quad 4  \end{array}  $ <p style="color: purple; font-size: small;">see purple below before correcting</p>
--	---

$$\begin{array}{l}
 4) \ x^2 - 14x - 72 \\
 = (x + 4)(x - 18)
 \end{array}
 \quad
 \begin{array}{l}
 5) \ x^2 + 9x - 10 \\
 = (x + 10)(x - 1)
 \end{array}
 \quad
 \begin{array}{l}
 6) \ x^2 - 13x - 30 \\
 = (x + 2)(x - 15)
 \end{array}$$

Summary 2: When the *last term is negative*, the two factors have 👉 opposite signs, and must 👉 add to get the middle term.

The middle sign indicates the sign of 👉 the larger factor.

**Always Remember: Factoring is the opposite of expanding.**

Therefore, you can **always check your factors by expanding.**

(It may take an extra minute or two, but you will catch when you make an error with your signs.)  
For example, you may want to check number 6 from above to see if you have the correct signs.

**Entertainment: pp. 253-255 #2, 3aceg, 9ace**

**Challenge: #15a**