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)

1,2,6,4, 3, 12

1	12
2	6
3	4
4	

b) List all the factors of 20

1	20
2	10
3	
4	5
5	

c) List all the factors of 30

1	30
2	15
3	10
4	
5	6

Today's Learning Goal(s):

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

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

MBF 3CI   5.3 Factoring Trinomials $x^2 + bx + c$ (Day 1)

"The Background"   Date: Apr-26/17

Expand the following:

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

$= x^2 + 5x + 3x + 15$
$= x^2 + 8x + 15$

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

$= x^2 + 6x + 5x + 30$
$= x^2 + 11x + 30$

expanding

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

$= x^2 + 9x + 14$

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

$= x^2 - 2x - 4x + 8$
$= x^2 - 6x + 8$

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 **the last term is positive**, using the Product/Sum method:

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

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

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

$= (x+3)(x+5)$ $= (x-3)(x-4)$ $\rightarrow (x-2)(x-20)$

| 1 | 15 |
| 3 | 5 |

1	12
2	6
3	4

-1	-40
-2	-20
-4	-10
5	8

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

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

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

$= (x-4)(x-10)$ $= (x-5)(x-8)$ $= (x+3)(x+6)$

1	18
2	9
3	6

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

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

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

$= (x+1)(x+2)$ $= (x-9)(x-8)$ $= D.N.F.$

(Does Not Factor)

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:

1) $x^2 + 18x - 40$

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

1	40
2	20
~~3~~	
4	10
5	8

2) $x^2 - 18x - 40$

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

3) $x^2 + 6x - 16$

$= (x + 8)(x - 2)$

-1 +16
-2 +8
~~3~~
-4 +4

4) $x^2 - 14x - 72$

$= (x + 4)(x - 18)$

$x^2 - 18x + 4x - 72$

$= x^2 - 14x - 72$

1	-72
2	-36
3	-24
4	-18
~~5~~	
6	+12
~~7~~	
8	-9

5) $x^2 + 9x - 10$

$= (x + 10)(x - 1)$

6) $x^2 - 13x - 30$

see purple below
before correcting

$= (x + 2)(x - 15)$

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

Knowledge Hook?