

Making hypothesis

Distribute the following

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

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

$(x-2)(x-7)$

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

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

$x^2 - 7x - 2x + 14$

$x^2 - 2x - 8$

$x^2 + 8x + 15$

$x^2 - 9x + 14$

How did you get -8 from -4 and 2?

• MULTIPLY! •

How did you get -2 from +2 and -4?

• ADD! •

It will factor to  $(x + \#)(x + \#)$

Where the two numbers need to and ADD to make b

MULTIPLY TO GET c  
ADD TO GET b

Example 1

$x^2 + 13x + 30$

WHAT <sup>PAIR</sup> MULTIPLIES TO GET 30 BUT ALSO ADD TO GET 13?

START WITH ALL THE MULTIPLES OF 30

- 1, 30
- 2, 15
- 3, 10
- 5, 6

$(x+10)(x+3)$

WHICH PAIRS CAN ALSO ADD TO GET 13?

Example 2

$x^2 + 13x - 30$

MULTIPLES OF -30?

USING 1 - AND ONE + HOW CAN WE ADD TO GET 13?

- 1, 30
  - 2, 15
  - 3, 10
  - 5, 6
- 15 AND -2

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

SINCE c IS -30 WE WILL HAVE ONE NEGATIVE AND ONE POSITIVE NUMBER (BECAUSE A NEGATIVE x POSITIVE IS NEGATIVE)

Example 3

$x^2 - 11x + 30$

MULTIPLES OF 30

THE PAIRS ARE GOING TO BOTH BE NEGATIVE

- 1, 30
- 2, 15
- 3, 10
- 6, 5

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

$-6 + -5 = -11$   
30 IS POSITIVE BUT b (-11) IS NEGATIVE. SO A - TIMES A - IS POSITIVE BUT IF YOU ADD TWO NEGATIVES THE SUM IS STILL NEGATIVE

Example 4

$x^2 - x - 6$

MULTIPLES OF -6?

$(x-3)(x+2)$

- 1, 6
  - 2, 3
- $-3 + 2 = -1$

MULTIPLY TO GET A NEGATIVE? ONE OF EACH!