Algebra 1   8.6
Factor trinomials
Solve quadratic equations by factoring

quadratic $1x^2 + 3x + 2$
EWE $\uparrow$
Factor $= (\quad)(\quad)$
Zero product property
activity: x-factor

whiteboards?

look at patterns...

$x+3$
$x+4$

$4x$ 12 $(x+3)(x+4) = x^2 + 7x + 12$
$3x$

$(x+5)(x+2) = x^2 + 7x + 10$

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

$2x$ 10
$5x$ $(x-3)(x-5) = x^2 - 8x + 15$

$(x+2)(x+4) = x^2 + 6x + 8$

8

6

Example 1 *b* and *c* are Positive

Factor $x^2 + 9x + 20$.

$(x+5)(x+4)$

$$\begin{array}{c} 20 \\ 5 \times 4 \\ 9 \end{array}$$

Factor each polynomial.

1A. $d^2 + 11d + 24$

$(d+8)(d+3)$

$(d+3)(d+8)$

24
8   3
11

1B. $9 + 10t + t^2$

rewrite in standard form first

$t^2 + 10t + 9$

9×1

$9, 1$

10

$(t + 9)(t + 1)$

Example 2 *b* is Negative and *c* is Positive

Factor $x^2 - 8x + 12$. Confirm your answer

$$12$$
$$-2 \diagup -6$$
$$-8$$

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

What does "confirm your answer" mean?

2B. $w^2 - 11w + 28$

$$(w-7)(w-4)$$

$$\begin{array}{c} 28 \\ \times \\ -11 \end{array}$$

2A. $21 - 22m + m^2$ standard form

Example 3 c is Negative

Factor each polynomial.

a. $x^2 + 2x - 15$

b. $x^2 - 7x - 18$

3A. $y^2 + 13y - 48$

1   48
2   24
-3 +16
4   ~~6~~ 12
6   8

3B. $r^2 - 2r - 24$

$$\left(x - 6\right)\left(x + 4\right)$$

$$\left(r - 6\right)\left(r + 4\right)$$

Solve:

$$x^2 + 5x + 6 = 0$$

$(x+2)(x+3) = 0$

$$x + 2 = 0 \qquad x + 3 = 0$$
$$-2 \quad -2 \qquad x = -3$$

$$x = -2 \qquad x = -3$$

Solve

$$x^2 + 7x + 12 = 0$$

$$x^2 - 5x - 6 = 0$$

$$x^2 + 5x + 1 \quad \text{prime}$$

$$x^2 + 5x + 1 = 0 \quad NS$$