

Algebra 1 8.6

Factor trinomials

Solve quadratic equations by factoring

quadratic

EWE

Factor

Zero product property

activity: x-factor

$$1x^2 + 3x + 2 = ( \quad )( \quad )$$

whiteboards?

look at patterns...

$$\begin{array}{r} x+3 \\ x+4 \\ \hline 4x \\ 3x \\ \hline 12 \end{array} (x+3)(x+4) = x^2 + 7x + 12$$

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

$$\begin{array}{r} x+5 \\ x+2 \\ \hline 4x \\ 3x \\ \hline 10 \end{array} (x+5)(x+6) = x^2 + 11x + 30$$

$$\begin{array}{r} x-3 \\ x-5 \\ \hline 4x \\ 5x \\ \hline 15 \end{array} (x-3)(x-5) = x^2 - 8x + 15$$

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

$$\begin{array}{r} 8 \\ \times \\ 6 \\ \hline \end{array}$$

**Example 1** *b* and *c* are Positive

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

$$\begin{array}{r} 20 \\ 5 \quad 4 \\ \hline 9 \end{array} \quad (x+5)(x+4)$$

Factor each polynomial.

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

$$\begin{array}{r} 24 \\ 8 \times 3 \\ \hline 11 \end{array}$$

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

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

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

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rewrite in standard form first

$$t^2 + 10t + 9$$

$$\begin{array}{c} \diagup \quad 9 \quad \diagdown \\ 9 \quad \times \quad 1 \\ \diagdown \quad 10 \quad \diagup \end{array} \quad (t+9)(t+1)$$

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

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

$$\begin{array}{r} 12 \\ -2 \quad -6 \\ -8 \end{array} \quad (x-2)(x-6)$$

What does "confirm your answer" mean?

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

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

~~$$\begin{array}{r} 28 \\ \sqrt{-11} \end{array}$$~~

**2A.**  $21 - 22m + m^2$

standard form

**Example 3**  $c$  is Negative

Factor each polynomial.

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

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

### Guided Practice

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

1 48

2 24

-3 +16

4 ~~12~~

6 8

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

$$(x-6)(x+4)$$

$$(r-6)(r+4)$$

Solve:

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

$$\begin{array}{r} 76 \\ 2 \overline{) 3} \\ \underline{5} \end{array}$$

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

$$\begin{array}{l} \downarrow \\ x+2=0 \\ -2 \quad -2 \end{array}$$

$$\begin{array}{l} \downarrow \\ x+3=0 \\ -3 \quad -3 \\ x \quad -3 \end{array}$$

$$x = -2 \quad x = -3$$

Solve

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

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

~~1  
5~~

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

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

due Mon

p. 507

13-29018

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WB skills  
1-25 odds

meths.