

Algebra 1 8.6

Factor trinomials

Solve quadratic equations by factoring
quadratic $x^2 \dots$

EWE

Factor

Zero product property

activity: x-factor

whiteboards

$$\begin{array}{l} (x+4) \\ (x-3) \\ \hline -3x \quad -12 \\ y^2 \quad 4x \\ \hline x^2 + x - 12 \end{array}$$

look at patterns...

$$(x+3)(x+4) = x^2 + \underline{7x} + \underline{12}$$

$$(x+1)(x+5) = x^2 + 6x + 5$$

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

$$(x+2)(x+3) = x^2 + 5x + 6$$

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

$$(x-6)(x-6) = x^2 - 12x + 36$$

$$\begin{array}{r} x+3 \\ x+4 \\ \hline \end{array}$$

Example 1 b and c are Positive

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

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

$$\begin{array}{r} x+5 \\ x+4 \\ \hline x^2 \quad 4x+20 \\ \quad 5x \\ \hline \end{array}$$

Factor each polynomial.

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

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

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

product

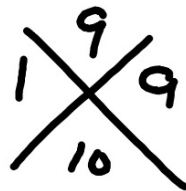
$$\begin{array}{ccc} & 24 & \\ 3 & \times & 8 \\ & 11 & \\ & \text{Sum} & \end{array}$$

$$\begin{array}{ccc} & 24 & \\ 8 & \times & 3 \\ & 11 & \end{array}$$

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

rewrite in standard form first

$$t^2 + 10t + 9$$
$$(t + 1)(t + 9)$$



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

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

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

$$\begin{array}{cc} 12 & \\ -2 & -6 \\ \hline & -8 \end{array}$$

What does "confirm your answer" mean?

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

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

~~$\begin{array}{r} 28 \\ -4 \quad -7 \\ \hline -11 \end{array}$~~

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

$$m^2 - 22m + 21$$

$$(m-21)(m-1)$$

standard form

$$\begin{array}{r} 21 \\ -21 \end{array} \begin{array}{r} -1 \\ -22 \end{array}$$

$$\begin{array}{r} 1 \ 21 \\ 3 \ 7 \end{array}$$

Example 3 c is Negative

Factor each polynomial.

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

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

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

$$\begin{array}{c} p \\ -3 \quad -15 \\ \quad \quad 5 \\ 2 \\ s \end{array}$$

$$\cancel{(x-5)(x+3)}$$

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

GuidedPractice

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

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