

6.3: Factoring Trinomials (when the leading coefficient > 1)

6.3.3

Note Title

10/29/2018

Ex: Factor.

$$2x^2 + x - 15$$

(-) signs are opposite
want a difference of
1x for middle term

$$(2x - 5)(x + 3)$$

$$\begin{array}{cc} 2x^2 & 15 \\ \wedge & \wedge \\ 2x \cdot x & 1 \cdot 15 \\ & 3 \cdot 5 \end{array}$$

5x
6x

Check: $(2x - 5)(x + 3)$

$$= 2x^2 + 6x - 5x - 15$$

$$= 2x^2 + x - 15 \checkmark$$

Ex: Factor.

$$4x^2 - 7x - 15$$

(-) signs are opposite
want a difference of 7x for my
middle term

$$(4x + 5)(x - 3)$$

$$\begin{array}{cc} 4x^2 & 15 \\ \wedge & \wedge \\ 4x \cdot x & 1 \cdot 15 \\ 2x \cdot 2x & 3 \cdot 5 \end{array}$$

5x
12x

Check: $4x^2 - 12x + 5x - 15$

$$4x^2 - 7x - 15 \checkmark$$

$$(x - 3)(4x + 5)$$

6.3.4

Ex.: $6x^2 + 19x + 14$

(+) same signs
want sum of $19x$ for middle term

$$(6x + 7)(x + 2)$$

Check: $6x^2 + 12x + 7x + 14$
 $= 6x^2 + 19x + 14 \checkmark$

$6x^2$	14
$\wedge$	$\wedge$
$2x \cdot 3x$	$1 \cdot 14$
$6x \cdot x$	$2 \cdot 7$

$7x$ (from $2x \cdot 3x$)
 $12x$ (from $6x \cdot x$)

Ex.: Factor.

(+) same signs
want a sum of $13x$

$$3x^2 - 13x + 12$$

$$(3x - 4)(x - 3)$$

$$3x^2 - 9x - 4x + 12$$

$$3x^2 - 13x + 12$$

$3x^2$	12
$\wedge$	$\wedge$
$3x \cdot x$	$1 \cdot 12$
	$2 \cdot 6$
	$3 \cdot 4$

$4x$ (from $3x \cdot x$)
 $9x$ (from $3x \cdot x$)

Ex.: $7x^2 - 10x + 3$

$$(7x - 3)(x - 1)$$

$$7x^2 - 7x - 3x + 3$$

$$7x^2 - 10x + 3$$

6.3.5

Ex: $18x + 5x^2 - 8$
 $= 5x^2 + 18x - 8$
 $= \boxed{(5x - 2)(x + 4)}$ ✓
 $5x^2 + 20x - 2x - 8$
 $5x^2 + 18x - 8$

$$\begin{array}{cc} 5x^2 & 8 \\ \uparrow & \uparrow \\ 5x \cdot x & 1 \cdot 8 \\ & \text{2} \cdot 4 \\ & \text{20x} \end{array}$$

Ex: $5x^2 - 22xy + 8y^2$
 $\boxed{(5x - 2y)(x - 4y)}$

(+) same signs
 want sum
 of 22xy

$$\begin{array}{cc} 5x^2 & 8y^2 \\ \uparrow & \uparrow \\ 5x \cdot x & 1y \cdot 8y \\ & \text{2y} \cdot 4y \\ & \text{20xy} \end{array}$$