

Lesson 1.5 Factoring "LOIF"

Algebra 2R

Factoring Trinomials: $ax^2 + bx + c$

- Factor the "a" term (use positive values)
- Factor the "c" term
- Check that they add to the "b" term
 - If off by a negative switch the signs

1. $x^2 + 5x + 6$ *Same sign*

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

multiply to

$$\begin{array}{c} 6 \\ \swarrow \searrow \\ 2 \quad 3 \\ \swarrow \searrow \\ 6 \quad 1 \end{array}$$

add to

$$5$$

2. $x^2 + x - 6$ *different*

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

$$\begin{array}{c} -6 \\ \swarrow \searrow \\ -2 \quad 3 \\ \swarrow \searrow \\ 2 \quad -3 \\ \swarrow \searrow \\ -6 \quad 1 \\ \swarrow \searrow \\ 6 \quad -1 \end{array}$$

$$1$$

3. $x^2 - 5x + 6$ *Same sign*

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

$$\begin{array}{c} 6 \\ \swarrow \searrow \\ -2 \quad -3 \\ \swarrow \searrow \\ -6 \quad -1 \end{array}$$

$$-5$$

4. $x^2 - x - 6$ *different signs*

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

$$\begin{array}{c} -6 \\ \swarrow \searrow \\ -2 \quad 3 \\ \swarrow \searrow \\ 2 \quad -3 \\ \swarrow \searrow \\ -6 \quad 1 \\ \swarrow \searrow \\ 6 \quad -1 \end{array}$$

$$-1$$

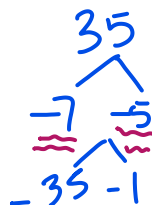
5. $6x^2 - 31x + 35$ Same

$$(2x - 7)(3x - 5)$$

Factor a



Factor c

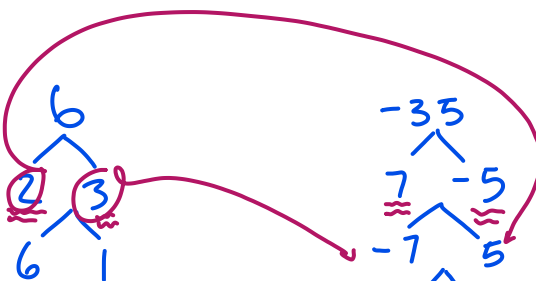


$$\begin{aligned} -14 - 15 &= -29 \\ -21 - 10 &= -31 \end{aligned}$$

$$6x^2 - 10x - 21x + 35 \checkmark$$

6. $6x^2 - 11x + 35$ different signs

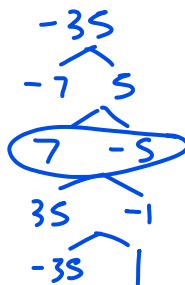
$$(2x - 7)(3x + 5)$$



$$\begin{aligned} 14 - 15 &= -1 \\ 21 - 10 &= 11 \\ -21 + 10 &= -11 \end{aligned}$$

7. $6x^2 + 37x + 35$ different

$$(6x - 5)(x + 7)$$

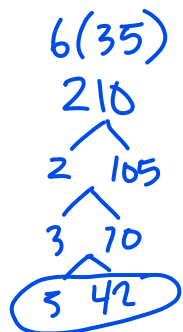


$$\begin{aligned} -14 + 15 &= +1 \\ -21 + 10 &= -11 \\ 14 - 15 &= -1 \\ 21 - 10 &= 11 \\ -42 + 5 &= -37 \\ 42 - 5 &= 37 \end{aligned}$$

factor (216)

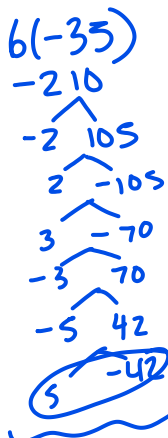
8. $6x^2 + 47x + 35$

$$\begin{aligned} &6x^2 + 42x + 5x + 35 \\ &6x(x + 7) + 5(x + 7) \\ &(x + 7)(6x + 5) \end{aligned}$$



9. $6x^2 - 37x - 35$

$$\begin{aligned} &6x^2 - 42x + 5x - 35 \\ &6x(x - 7) + 5(x - 7) \\ &(x - 7)(6x + 5) \end{aligned}$$



10. $6x^2 - 41x + 35$

$$\begin{aligned} &6x^2 - 6x - 35x + 35 \\ &6x(x - 1) - 35(x - 1) \\ &(6x - 35)(x - 1) \end{aligned}$$

