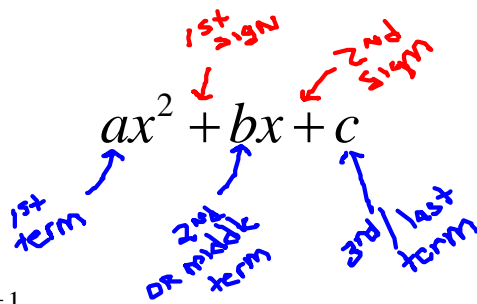


# Factoring - Quadratic Trinomials



$a=1$

Step 1: Look for the factors of the last term that either add or subtract (depending on the 2<sup>nd</sup> sign) to the middle term.

Step 2: Find the signs:

- If the second sign is positive, then both signs inside the parentheses get the first sign.
- If the second sign is negative, then the bigger number inside the parentheses gets the first sign.

1. Factor each trinomial.

a)  $x^2 + 11x + 30$

Factors of 30:  $1 \cdot 30$ ,  $2 \cdot 15$ ,  $3 \cdot 10$ ,  $5 \cdot 6$

$(x + 5)(x + 6)$

b)  $x^2 - 12x + 32$

Factors of 32:  $1 \cdot 32$ ,  $2 \cdot 16$ ,  $4 \cdot 8$

$(x - 4)(x - 8)$

c)  $y^2 - 21y - 72$

Factors of 72:  $1 \cdot 72$ ,  $2 \cdot 36$ ,  $3 \cdot 24$ ,  $4 \cdot 18$ ,  $6 \cdot 12$ ,  $8 \cdot 9$

$(y + 3)(y - 24)$

d)  $m^2 - 5m - 24$

Factors of 24:  $1 \cdot 24$ ,  $2 \cdot 12$ ,  $3 \cdot 8$ ,  $4 \cdot 6$

$(m + 3)(m - 8)$

e)  $\frac{3g^2}{3} + \frac{6gh}{3} - \frac{189h^2}{3}$

GCF = 3

$3(g^2 + 2gh - 63h^2)$

Factors of 63:  $1 \cdot 63$ ,  $3 \cdot 21$ ,  $7 \cdot 9$

$3(g - 7h)(g + 9h)$

$$a \neq 1$$

Step 1: List the factors of the first and last terms.

Step 2: Look for the outer and inner products that either add or subtract (depending on the 2<sup>nd</sup> sign) to the middle term.

Step 3: Find the signs:

- If the second sign is positive, then both signs inside the parentheses get the first sign.
- If the second sign is negative, then the bigger product inside the parentheses gets the first sign.

2. Factor each trinomial.

a)  $3x^2 + 10x + 8$

Factors of 3:  $1 \cdot 3$   
 Factors of 8:  $1 \cdot 8, 2 \cdot 4$

Handwritten work shows a failed attempt:  $(1x + 4)(3x + 2)$  is labeled "wrang".

The correct factorization is:  $(x + 2)(3x + 4)$

b)  $2x^2 - 17x + 30$

Factors of 2:  $1 \cdot 2$   
 Factors of 30:  $1 \cdot 30, 2 \cdot 15, 3 \cdot 10, 5 \cdot 6$

Handwritten work shows a failed attempt:  $(2x + 6)(x + 5)$  is labeled "wrang".

The correct factorization is:  $(2x - 5)(x - 6)$

c)  $6y^2 - 25y + 9$

Factors of 6:  $1 \cdot 6, 2 \cdot 3$   
 Factors of 9:  $1 \cdot 9, 3 \cdot 3$

Handwritten work shows a failed attempt:  $(2y - 3)(3y + 3)$  is labeled "wrang".

The correct factorization is:  $(2y - 9)(3y + 1)$

d)  $40x^2 + 70x - 75$

GCF = 5

Factor out 5:  $5(8x^2 + 14x - 15)$

Factors of 8:  $1 \cdot 8, 2 \cdot 4$   
 Factors of 15:  $1 \cdot 15, 3 \cdot 5$

Handwritten work shows the correct factorization:  $5(2x + 5)(4x - 3)$