

Factoring Trinomials by the Trial and Error Method

(when the coefficient of the 1st term is a 1)

1. Always factor out the greatest common factor first!

If the first term is a negative also factor out a (-1) as this will make the factoring process easier. (Note: At this point the coefficient in front of the first term should be a 1 then the following steps do not apply.)

2. Setting up your first terms!

After factoring out the common factor, the trinomial will factor into two binomials as shown below **if it is factorable.**

$$(First\ term \pm Last\ term)(First\ term \pm Last\ term)$$

The first terms multiplied together should equal the first term of the trinomial.

3. Getting the signs right!

If the last term of the trinomial is positive then the signs will be the same as the middle term either both positive or both negative. If the last term of the trinomial is negative then the signs will be different, one positive and one negative.

4. Last terms: Trial and Error!

The product of the last terms always multiply together to give you the last term of the trinomial. (Note: Be sure to include the signs of the last terms when multiplying and adding.)

Example 1: $x^2 - 9x + 20$

There is no common factor so we begin by setting up the first terms as follows:

$$(x \quad)(x \quad)$$

Next we get the signs right. Since the last term is positive, the signs will be the same as the middle term which is negative.

$$(x - \quad)(x - \quad)$$

Finally we determine the last term by trial and error. The last terms multiplied together should equal 20 and when added equal -9 . Therefore our last terms will be -4 and -5 .

$$(x - 4)(x - 5)$$

Example 2: $x^2 - x - 20$

Again there is no common factor so we begin by setting up the first terms as follows:

$$(x \quad)(x \quad)$$

Next we get the signs right. Since the last term is negative, one term will be positive and the other will be negative.

$$(x + \quad)(x - \quad)$$

Finally we determine the last term by trial and error. The terms multiplied together must equal -20 and when added equal -1 . Therefore our last terms will be -5 and 4 .

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