**How to Factor Trinomials**

**(when the leading coefficient is not 1)**

1. Factor out a GCF if possible.

Ex:

This is what we will factor.

We will “ignore” the 2 for now, but remember it for your answer!



2. With the terms in descending powers, multiply the first coefficient (**a**) by the last number (**c**)

In our example, a=2 and c=3, so we find numbers that multiply to give us 6.

|  |  |
| --- | --- |
| 6 | |
| 1 | 6 |
| 2 | 3 |

3. Find factors of **ac** that add to the middle coefficient (**b**).

In our example, b=7, so we need to find which multiples add to 7.

1 + 6 = 7, so we will use the factors 1 and 6 to split our middle term.

(Note that 2 + 3 = 5 so we do not use those factors.)

4. Split **b** into these two factors.



5. Factor by grouping until completely factored.



6. Check to be sure that if you factored out a GCF in step one, you include it in your solution.

We factored out a 2 in step one, so it will need to be included in our solution.



6. Always check your answer by multiplying out your answer. You should get the original problem.