

Factoring Trinomials $ax^2 + bx + c$



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

This worksheet provides additional examples to help you understand how to factor trinomials where the x^2 term has a coefficient other than 1. We'll look at different combinations of positive and negative signs, and also cases where you need to take out a GCF first.

Part 1: Basic Cases (All Positive)

Example 1: Factor $2x^2 + 7x + 6$

Example 2: Factor $5x^2 + 12x + 4$



Part 2: Negative Middle Term ($b < 0, c > 0$)

When c is positive, both magic numbers have the same sign as b . Since b is negative here, both numbers will be negative.

Example 3: Factor $3y^2 - 10y + 8$

Part 3: Negative Last Term ($c < 0$)

When c is negative, the two magic numbers will have *different* signs. The larger number (ignoring its sign) will have the same sign as b .

Example 4: Factor $5a^2 + 13a - 6$



Example 5: Factor $4k^2 - 7k - 15$

Part 4: Factoring Out a GCF First!

Always check for the Greatest Common Factor (GCF) for *all three terms* before trying to factor a trinomial. If there's a GCF, factor it out first, and then factor the remaining trinomial.

Example 6: Factor $6x^2 + 33x + 36$



Example 7: Factor $-5m^2 + 20m - 15$

Part 5: Trinomials That Cannot Be Factored (Prime)

Just like with the $x^2 + bx + c$ form, not every trinomial can be factored into two binomials with integer coefficients. If you can't find two "magic numbers" that satisfy both multiply to $a \times c$ and add to b , the trinomial is called prime.

Example 8: Factor $3x^2 + 2x + 5$