A C METHOD

The AC Method is a method of factoring trinomials in the form $ax^2 + bx + c$. It forms an alternative to the "guessing method."

Given a quadratic expression with the terms $ax^2 + bx + c$, we are often asked to factor. What we are being asked to do is find two expressions, which multiply to give the original expression.

Example: $2x^2 - 11x + 5$

Step 1: Factor any common terms. Then identify $a$, $b$, and $c$. In our example, $a = 2$, $b = -11$, and $c = 5$.

Step 2: Multiply $a$ and $c$. In this case, $ac = 10$.

Step 3: What are all of the factors of $ac$? Since $ac = 10$, what two numbers can we multiply to get 10 back? $(1 \cdot 10), (-1 \cdot -10)$ or $(2 \cdot 5), (-2 \cdot -5)$ would be the answer in this case.

Step 4: If $ac$ is positive, add the factors to form the number $b$. If $ac$ is negative, subtract the factors to form the number $b$.

Since 10 is positive, we look for factors which add to -11. Thus, we choose -10 and -1 as our factors.

Step 5: Replace the middle term with the new terms from step 4. We replace $(-11x)$ with $(-10x)$ and $(-1x)$ to yields $2x^2 - 10x - 1x + 5$.

Note that we used -10 and -1. This is so that if we add them back together, we get the original $b = -11$ back.

Step 6: Group the equation into two separate parts. $(2x^2 - 10x) + (-1x + 5)$.

The -1 is included in the second parenthesis and the two new terms are joined by an addition sign.

Step 7: Find the common factors in each group and factor them to the front of their group. $2x(x-5) - 1(x-5)$

Step 8: If Step 7 is performed correctly, then the first and second terms should have a common factor. In our case it is $(x-5)$. Now factoring this out to the front gives us $(x - 5)(2x - 1)$.

Step 9: Check your answer in Step 8 by multiplying the two factors with the First, Outside, Inside, Last (FOIL) method. $(x - 5)(2x - 1)$

$= 2x^2 - x - 10x + 5$

$= 2x^2 - 11x + 5$

which was the original problem. So now we know that the factors of $2x^2 - 11x + 5$ are $(x-5)$ and $(2x - 1)$.

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