Answer on Question#39979 - Math - Algebra

We have $35x^2 - 57x - 44.$

With the trial-and-error method, we start by assuming that the trinomial factors as a product of two binomials. In other words, we assume that the factors take the following form:

$$(a \cdot x + b)(c \cdot x + d)$$

The first term in the trinomial is $35r^2$, and it comes from multiplying $a \cdot x$ and $c \cdot x$ together.

The factors of 35 are:

$$(1)(35), (5)(7), (-1)(-35), (-5)(-7).$$

So the factors of our trinomial must take one of the following forms:

$$(x + b)(35x + d), (-x + b)(-35x + d), (5x + b)(7x + d), (-5x + b)(-7x + d).$$

Now, the last term in our trinomial is -44. It comes from multiplying $b \cdot d$. This means that b and d must be factors of -44.

The factors of -44 are:

$$(1)(-44), (-1)(44), (-2)(22), (2)(-22), (-4)(11), (4)(-11).$$

So, our factoring has to be one of the following:

$(x \pm 1)(35x \mp 44), (x \pm 44)(35x \mp 1), (x \pm 2)(35x \mp 22), (x \pm 22)(35x \mp 2), (x \pm 4)(35x \pm 11),$

$(x \pm 11)(35x \mp 4);$

$(-x \pm 1)(-35x \mp 44), (-x \pm 44)(-35x \mp 1), (-x \pm 2)(-35x \mp 22), (-x \pm 22)(-35x \mp 2),$

$(-x \pm 4)(-35x \pm 11), (-x \pm 11)(-35x \mp 4);$

$(5x \pm 1)(7x \mp 44), (5x \pm 44)(7x \mp 1), (5x \pm 2)(7x \mp 22), (5x \pm 22)(7x \mp 2), (5 \pm 4)(7x \pm 11),$

$(5 \pm 11)(7x \mp 4);$

$(-5x \pm 1)(-7x \mp 44), (-5x \pm 44)(-7x \mp 1), (-5x \pm 2)(-7x \mp 22), (-5x \pm 22)(-7x \mp 2),$

$(-5 \pm 4)(-7x \pm 11), (-5 \pm 11)(-7x \mp 4);$

The last step is checking these possibilities until we find the right one.

After checking we can see that the correct option is $(\mathbf{7x + 4})(\mathbf{5x - 11})$.

$$(7x + 4)(5x - 11) = 35x^2 - 77x + 20x - 44 = 35x^2 - 57x - 44$$

Answer: $35x^2 - 57x - 44 = (7x + 4)(5x - 11).$