

Factoring Trinomials Using the A-C Method

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The *A-C Method* is also called the *Grouping Method*.

Example: $8x^2 - 10x + 3$

This trinomial is in the form $Ax^2 + Bx + C$.

$$A = 8$$

$$B = -10$$

$$C = 3$$

To determine the signs of the two binomials in the answer, look at the sign of the last term in the trinomial, +3 here. Since '+' the signs of both binomials in the answer will be the same. To find out which sign, look at the sign of the middle term $-10x$. Since it is '-' the signs of the two binomials in the answer will be '-' like $(-)(-)$.

- If the middle term would have been $+10x$, then the signs of the two binomials in the answer would have been '+' like $(+)(+)$.
- If the sign of the last term is '-' the signs of the two binomials in the answer will be opposite like $(-)(+)$ or $(+)(-)$.

Create template for the two binomials in the answer. For this example, it will be $(ax -)(bx -)$.

Steps:

1. Find the product of $A \cdot C$ or $8 \cdot 3 = 24$.
2. Write out all factors of 24 using the table of factors and their sums below. We know from above that the two factors will be negative. There is no need to list positive factors of 24 in the table, such as $1 \cdot 24$, $2 \cdot 12$, etc.

<u>Factors of 24</u>	<u>Sum</u>
$-1 \cdot -24$	-25
$-2 \cdot -12$	-14
$-3 \cdot -8$	-11
$-4 \cdot -6$	-10

3. The two '-' factors whose sum is the coefficient of the middle term $B = -10$, are -4 and -6 .

Continued 

4. Use the two factors found -4 and -6 to replace the middle term $-10x$. The following two trinomials are equivalent: $8x^2 - 10x + 3$ and $8x^2 - 4x - 6x + 3$

5. Factor by grouping:

$$\underbrace{8x^2 - 4x} \quad \underbrace{-6x + 3}$$

6. Factor $4x$ from $8x^2 - 4x$ and factor -3 from $-6x + 3$

7. The result is $4x(2x - 1) - 3(2x - 1)$

8. Finally, factor out the common expression $2x - 1$ from $4x(2x - 1) - 3(2x - 1)$

9. We are left with the answer: $(2x - 1)(4x - 3)$