Factoring Using the AC Method

1. Factor out all common factors, if there are any.
2. Identify *A, B,* and *C* then multiply *A* and *C* ($Ax^2 + Bx + C$).
3. List all factors of *AC*.
4. If *AC* is positive, find the pair of factors that add to get *B*. If *AC* is negative, find the pair of factors that subtract to get *B*.
5. Replace *B* with the two new terms from Step 4.
6. Group the expression into two separate parts.
7. Factor out the common factors in each group (factor by grouping).
8. What is in each parentheses should be the same, and is now one of the factors. The other factor is what is in front of each parentheses, combined to make a binomial.

Example: $24x^2 + 10x - 4$

$2(12x^2 + 5x - 2)$ Step 1

$A = 12, B = 5, C = -2, AC = -24$ Step 2

-24   Step 3
$1 \cdot 24$
$2 \cdot 12$
$3 \cdot 8$
$4 \cdot 6$

$-24 = -3 \cdot 8$ Step 4
$2(12x^2 \quad\quad + 5x \quad - 2)$

$2(12x^2 - 3x \quad + 8x - 2)$ Step 5
$2[(12x^2 - 3x) + (8x - 2)]$ Step 6   2
$[3x(4x - 1) + 2(4x - 1)]$ Step 7
$2(4x - 1)(3x + 2)$ Step 8 Answer

Example: $8x^2 - 6x - 5$

$A = 8, B = -6, C = -5, AC = -40$ Step 2

40   Step 3
$1 \cdot 40$
$2 \cdot 20$
$4 \cdot 10$
$5 \cdot 8$

$-40 = 4 \cdot -10$ Step 4
$8x^2 \quad - 6x \quad - 5$
$8x^2 + 4x \quad - 10x - 5$ Step 5
$(8x^2 + 4x) + (-10x - 5)$ Step 6 $4x(2x + 1) - 5(2x + 1)$ Step 7

(2x + 1)(4x − 5)

Step 8 Answer

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