

# C\_04 Key Factoring AC Method

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# (Decomposition AC Method)

## Factoring Practice

**Example** Factor  $4x^2 - 3x - 7$

**Solution:** The first step is to multiply the first and last coefficients:  $(4)(-7) = -28$ . We need the factors of -28 whose sum is -3. The factors of 28 are: 1 & 28, 2 & 14, and 4 & 7. The factors needed are 4 & -7 (remember the sum must be -3). We now re-write the middle term of the trinomial and factor by grouping:

$$\begin{aligned} &4x^2 - 3x - 7 \\ &4x^2 + 4x - 7x - 7 \\ &4x(x+1) - 7(x+1) \\ &(x+1)(4x-7) \end{aligned}$$

1)  $7m^2 + 6m - 1$

$AC = -7$   
 $B = 6$   
 $(-7, -1)$

$$\begin{aligned} &7m^2 + 7m - 1m - 1 \\ &= 7m(m+1) - 1(m+1) \\ &\boxed{(m+1)(7m-1)} \end{aligned}$$

2)  $3k^2 - 10k + 7$

$AC = 21$   
 $B = -10$   
 $(-3, -7)$

$$\begin{aligned} &3k^2 - 3k - 7k + 7 \\ &= 3k(k-1) - 7(k-1) \\ &\boxed{(k-1)(3k-7)} \end{aligned}$$

3)  $3n^2 - 16n + 20$

$AC = 60$   
 $B = -16$   
 $(-10, -6)$

$$\begin{aligned} &3n^2 - 10n - 6n + 20 \\ &= n(3n-10) - 2(3n-10) \\ &\boxed{(3n-10)(n-2)} \end{aligned}$$

4)  $2r^2 + 7r - 30$

$AC = -60$   
 $B = 7$   
 $(12, -5)$

$$\begin{aligned} &2r^2 + 12r - 5r - 30 \\ &= 2r(r+6) - 5(r+6) \\ &\boxed{(r+6)(2r-5)} \end{aligned}$$

5)  $5x^2 - 14x + 8$

$AC = 40$   
 $B = -14$   
 $(-10, -4)$

$$\begin{aligned} &5x^2 - 10x - 4x + 8 \\ &= 5x(x-2) - 4(x-2) \\ &\boxed{(x-2)(5x-4)} \end{aligned}$$

6)  $4x^2 - 4x - 15$

$AC = -60$   
 $B = -4$   
 $(-10, 6)$

$$\begin{aligned} &4x^2 - 10x + 6x - 15 \\ &= 2x(2x-5) + 3(2x-5) \\ &\boxed{(2x-5)(2x+3)} \end{aligned}$$