Factoring by the AC Method
Trinomials of the form: $\boldsymbol{Ax^2 + Bx + C}$

Factor: $6x^2 + 23x + 20$

1. Multiply 'A' times 'C': $(6)(20) = 120$
2. Factor the product (AC) so that the factors combine to make B:

Factors of 120	Combine to Give 23
$1 \cdot 120$	~~$1 + 120 = 121$~~
$2 \cdot 60$	~~$2 + 60 = 62$~~
$3 \cdot 40$	~~$3 + 40 = 43$~~
$4 \cdot 30$	~~$4 + 30 = 34$~~
$5 \cdot 24$	~~$5 + 24 = 29$~~
$6 \cdot 20$	~~$6 + 20 = 26$~~
$\mathbf{8 \cdot 15}$	$\mathbf{8 + 15 = 23}$ **√**

3. Use the two factors to rewrite the middle term, giving you a polynomial with 4 terms.

$$6x^2 + 23x + 20$$

$$6x^2 + 8x + 15x + 20$$

4. Factor the resulting polynomial by grouping the first two terms together and the last two terms together.

$$(6x^2 + 8x) + (15x + 20)$$
$$2x(3x + 4) + 5(3x + 4)$$
$$\mathbf{(3x + 4)(2x + 5)}$$

5. Check your answer using FOIL.

Example # 1: Factor $4x^2 + 13x - 12$

1. $(4)(-12) = -48$
2. $(16)(-3) = -48$ and $16 + (-3) = 13$
3. $4x^2 + 16x - 3x - 12$
4. $(4x^2 + 16x) + (-3x - 12) = 4x(x + 4) - 3(x + 4) = (x + 4)(4x - 3)$

Example # 2: Factor $6x^2 - 19xy + 14y^2$

1. $(6)(14) = 84$
2. $(-12)(-7) = 84$ and $(-12) + (-7) = -19$
3. $6x^2 - 12xy - 7xy + 14y^2$
4. $(6x^2 - 12xy) + (-7xy + 14y^2) = 6x(x - 2y) - 7y(x - 2y) = (x - 2y)(6x - 7y)$

5. **Be sure to check your answers using FOIL.**