8-3 Factoring $x^2 + bx + c$

the degree is 2 (quadratic).
The number of terms is 3 (trinomial).
The leading coefficient is 1.

$$x^2 + \underset{\uparrow \text{added}}{b x} + \underset{\uparrow \text{multiplied}}{c}$$

$$(x \pm ?)(x \pm ?)$$

Steps to Factoring *Reverse FOIL

1. Draw the parentheses and fill in the variables.
2. Fill in the binomials with two numbers that:
   * when multiplied give "c"
   * when added give "b"

*Hint: if c is neg, you use one + and one −
       if c is pos, but b is neg, both are −

3. Check ✓ by FOILing

EXAMPLES:

1. $x^2 + 4x + 3$

$(x+1)(x+3)$

$x^2 + 3x + x + 3$
$x^2 + 4x + 3$ ✓

2. $x^2 + 8x - 20$

$(x+10)(x-2)$

$x^2 - 2x + 10x - 20$
$x^2 + 8x - 20$ ✓

3. $x^2 - 9x + 20$

$(x-4)(x-5)$

$x^2 - 5x - 4x + 20$
$x^2 - 9x + 20$ ✓