I. Factoring Trinomials, Part 1:

1. \((x + m)(x + n) = x^2 + x \cdot n + m \cdot x + m \cdot n\)
   \[= x^2 + nx + mx + mn\]
   \[= x^2 + (n + m)x + mn\]
   \[= x^2 + (m + n)x + mn\]
   \[= x^2 + bx + c\]
   provided: \(b = m + n \& c = m \cdot n\)

2. Find two numbers, \(m \& n\) whose sum is “b” and whose product is “c.”

3. Factor \(x^2 + 5x + 4\) as \((x + m)(x + n)\)
   need \(m + n = 5 \& 4 = m \cdot n\)
   \(i.e., \ m = 1 \& n = 4\)
   \(\therefore x^2 + 5x + 4 = (x + 1)(x + 4)\)
II. The Essential Idea:

“$x^2 + bx + c$” can be factored as $(x + m)(x + n)$ when $b = m + n$ and $c = mn$

III. Examples (p.399): Problems #2-26(even), 42, 64

HW: p.399 / Exercises #1-25(every other odd), 41, 45, 47, 61, 63

Read pp.395-398 (section 6.2)
I. Factor: \( ax^2 + bx + c \) (when \( a = 1 \), see section 6.2)

II. Factor: \( ax^2 + bx + c \) (when \( a \neq 1 \), see section 6.3)

\[
a x^2 + b x + c = (p x + m)(r x + n)
\]

find four numbers \( m, n, p \ & q \)
such that: \( pr = a, \ np + mr = b \ & mn = c \)

e.g., factor “6\(x^2 + 17x + 12\)”

\[
a = ___, \ b = ___, \ c = ___
\]
factors of 6 are ___, ___, ___, and ___
factors of 12 are ___, ___, ___, ___ and ___

need to find four numbers/factors such that...

\[
p \cdot r = 6, \ m \cdot n = 12 \ \text{and} \ n \cdot p + m \cdot r = ___
\]

try \((2x + m)(3x + n)\) with \( m = ___ \) and \( n = ___ \)

\[
\text{FOIL} \ (2x + 3)(3x + 4) = 6x^2 + _____ + ___
\]