L3 – Factor $x^2 + bx + c$ Unit 3

MPM2D

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To learn how to factor trinomials of the form $x^2 + bx + c$, let's study the expansion of $(x + m)(x + n)$

$$(x + m)(x + n) = x^2 + nx + mx + mn$$

$$= x^2 + mx + nx + mn$$

$$= x^2 + (m + n)x + mn$$

Compare the result above to the general expression $x^2 + bx + c$

$$x^2 + (m + n)x + mn$$

$$x^2 + bx + c$$

So to factor $x^2 + bx + c$, you must find the numbers that add to b and multiply to c.

General Rule:

$$x^2 + bx + c = (x + m)(x + n)$$

Where $b = m + n$ and $c = mn$

Example 1: Factor each of the following

a) $x^2 + 7x + 12$

b) $x^2 + 8x + 15$

c) $x^2 - 29x + 28$

d) $x^2 + 3x - 18$

e) $2x^2 - 8x - 42$

f) $-2x^2 + 8x + 42$

g) $x^2 + 11xy + 24y^2$

h) $x^2 + 10x + 25$

i) $x^4 + 4x^2 + 3$