

Distributive Property!

Unit 3: Polynomials

3.8 Diamond Method

We will use the Diamond Method when factoring "easy trinomials." That is, trinomials with a leading 1.

In order to do this we need an essential skill: "finding the magic numbers." Magic numbers are a pair of number that multiply to give a certain number and add to give another number.

Complete the tables to find two numbers with the given sum and the given product..

Sum	Product	Integers
12	20	2, 10
9	20	4, 5
4	4	2, 2
-9	18	-3, -6

Sum	Product	Integers
-15	14	-1, -14
-1	-6	2, -3
2	-15	-3, 5
-26	48	-2, -24

1×15
 3×5

 1×48
 2×24
 3×16
 4×12
 6×8

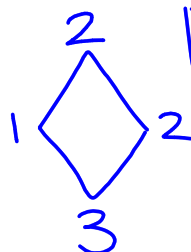
Distributive Property!

The Diamond Method

$ax^2 + \underline{bx} + c$

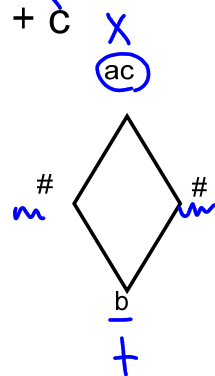
To find the sides of our diamond we look for the two numbers which multiply to ac but add to b .

Ex.) $x^2 + 3x + 2$

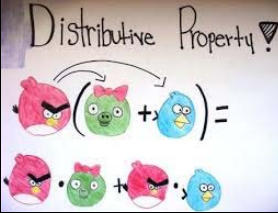



$(x + 1)(x + 2)$

$x^2 + 2x + 1x + 2$



Distributive Property!

Ex.) Factor the following trinomials where possible.

a) $x^2 + 8x + 12$

b) $x^2 + 13x + 12$

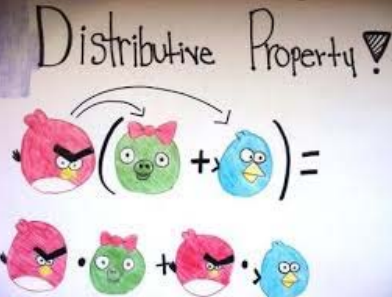

c) $a^2 - 11a + 10$

d) $y^2 + 3y + 4$

Handwritten solutions for (a) and (b) use diamond diagrams. For (a), the diamond has 12 at the top, 8 at the bottom, -6 on the left, and 2 on the right, leading to the factored form $(x+6)(x+2)$. For (b), the diamond has 12 at the top, 13 at the bottom, 1 on the left, and 12 on the right, leading to $(x+1)(x+12)$.

Handwritten solutions for (c) and (d) use diamond diagrams. For (c), the diamond has 10 at the top, -11 at the bottom, -1 on the left, and -10 on the right, leading to $(a-1)(a-10)$. For (d), the diamond has 4 at the top, 3 at the bottom, and no numbers on the sides, with the note "can't factor it" and "not factorable".

Distributive Property!

Ex.) Factor the following by removing a common factor first.

a) $4x^2 - 32x + 48$

b) $3x^3 + 21x^2 + 30x$

Handwritten solutions for (a) and (b) use diamond diagrams. For (a), the common factor 4 is factored out first, leaving $x^2 - 8x + 12$. The diamond for this quadratic has 12 at the top, -8 at the bottom, -2 on the left, and -6 on the right, leading to $4(x-2)(x-6)$. For (b), the common factor $3x$ is factored out first, leaving $x^2 + 7x + 10$. The diamond for this quadratic has 10 at the top, 7 at the bottom, 2 on the left, and 5 on the right, leading to $3x(x+2)(x+5)$.