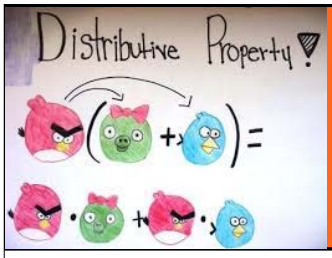


Unit 3: Polynomials

3.8 Diamond Method

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

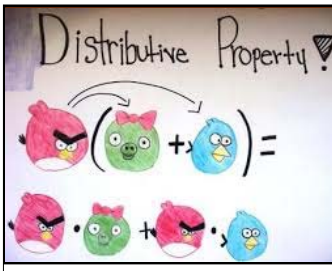
In order to do this we need an essential skill: "finding the magic numbers." Magic numbers are a pair of number that multiply to give a certain number and add to give another number.

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

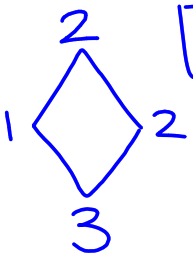


The Diamond Method

$ax^2 + bx + c$

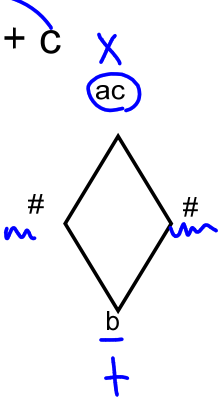
To find the sides of our diamond we look for the two numbers which multiply to ac but add to b.

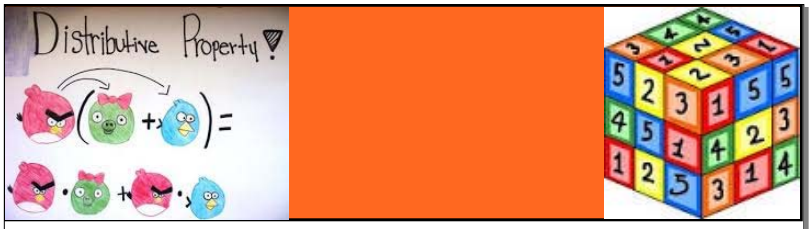
Ex.) $x^2 + 3x + 2$



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

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





Ex.) Factor the following trinomials where possible.

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

$(x+6)(x+2)$

12 / 6 / 2 / 8

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

12 / 1 / 12 / 13

$(x+1)(x+12)$

$(x+1)$

$(x+12)$

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

10 / -1 / -10 / -11

$(a-1)(a-10)$

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

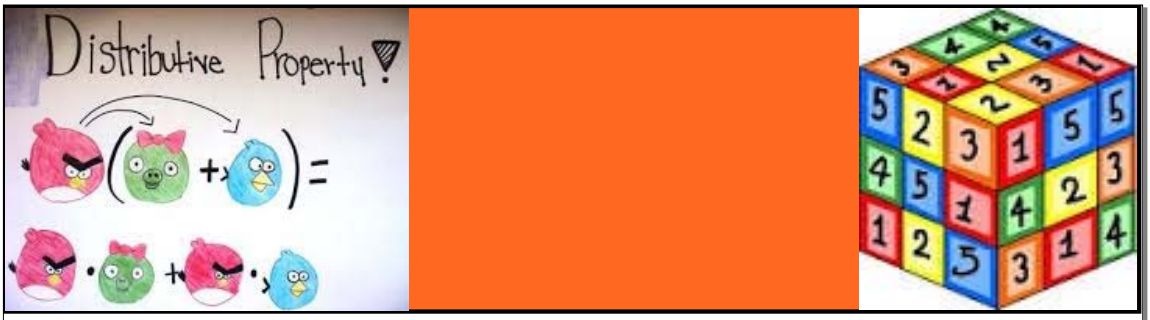
4 / 3

1×4

2×2

can't factor it

not factorable



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

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

$= 4(x^2 - 8x + 12)$

12 / -2 / -6 / -8

$= 4(x-2)(x-6)$

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

$= 3x(x^2 + 7x + 10)$

10 / 2 / 5 / 7

$= 3x(x+2)(x+5)$