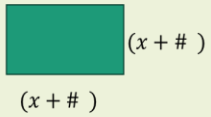
The Rules, $a = 1$

Rule 1: $\boldsymbol{ax^2 + bx + c}$

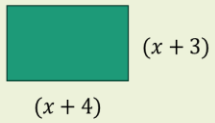
$ax^2 + bx + c$

Answer: $(x\ + \#)(x\ + \#)$



Example: $x^2 + 7x + 12$

- We want 2 numbers that will multiply to 12 and add up to 7.
- 3 and 4;
- 3 x 4 = 12, 3 + 4 = 7
- Both are numbers are positive
- Answer: $(x\ + \mathbf{3})(x\ + \mathbf{4})$

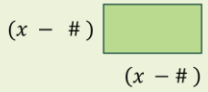


The Rules continued, $a = 1$

Rule 2: $\boldsymbol{ax^2 - bx + c}$

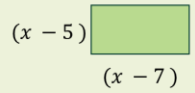
$ax^2 - bx + c$

Answer: $(x\ -\ \#)(x\ -\ \#)$



Example: $\boldsymbol{x^2 - 12x + 35}$

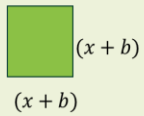
- We want 2 numbers that will multiply to 35 and add up to -12.
- -5 and -7 (Both numbers are Negative)
- -5 x -7 = 35; (-5) + (-7) = -12
- $(x - 5)(x - 7)$



The Rules continued, $a = 1$

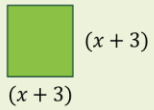
Rule 3: $(x + b)^2 =$
$(x\ + b)(x\ + b)$

A perfect square. All sides are equal.



Example: $\boldsymbol{x + 3x + 9}$

- We want 2 numbers that will multiply to 9 and add up to 6.
- 3 and 3;
- 3 x 3 = 9, 3 + 3 = 6.
- Both numbers are positive.
- Answer: $(x + 3)(x + 3)$ *or* $(x + 3)^2$

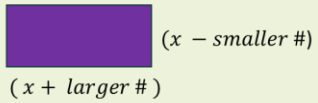


The Rules continued, $a = 1$

Rule 4: $\boldsymbol{ax^2 + bx - c}$

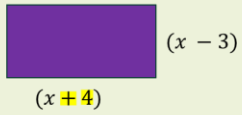
$ax^2 + bx - c$

$(x\ +\ \boldsymbol{larger}\ \#\ )(x\ -\ Smaller\ \#\ )$



Example: $\boldsymbol{x^2 + x - 12}$

- $x^2 + x - 12$
- $(x\ +\ \boldsymbol{larger}\ \#\ )(x\ -\ Smaller\ \#\ )$
- We want 2 numbers that will multiply to -12 and add up to 1.
- Order matters
- -3 and 4.
- (-3) x (4) = -12, (-3) + (4) = 1
- Answer: $(x - 3)(x + 4)$



Factoring Trinomals

When a = 1

(a + b)(a+ b)
(a + b)(a-b)
(a-b)(a-b)