

# 7.3 Factoring Trinomial in Form of $x^2 + bx + c$

$$\begin{array}{c} 18 \\ \wedge ? \\ 2+9=9 \end{array}$$

Factoring Trinomials when the last sign is "+":

$$\begin{array}{c} 18 \\ \wedge \checkmark \\ 6+3=9 \end{array}$$

– Trinomials are factored into 2 binomials

– ( \_\_\_ + \_\_\_ )( \_\_\_ + \_\_\_ ) or ( \_\_\_ - \_\_\_ )( \_\_\_ - \_\_\_ ) based

$$\text{Ex1) } x^2 \oplus 9x \oplus 18 = (x + 6)(x + 3)$$

on the middle term sign.

1st term   middle term   Last term

Split the 1st term evenly !!

⊗ Factors of the Last term & Add up equal the middle term.

$$\text{Ex2) } x^2 + 10x + 9 = (x + 9)(x + 1)$$

Factors of 9  $\begin{matrix} 9 \\ 1 \end{matrix}$   
and Add up  
gives  $10 = 9 + 1$

$$\text{Ex3) } x^2 - 12x + 32 = (x - 8)(x - 4)$$

Factor of 32  $\begin{matrix} 8 \\ 4 \end{matrix}$   
and Add up  
gives  $12 = 8 + 4$

$$\text{Ex4) } x^2 - 13xy + 40y^2 = (x - 5y)(x - 8y)$$

Factors of 40  $\&$  add up equal 13 = 5 + 8  
^  
5 8

$$\text{Ex5) } x^2 + 18xy + 32y^2 = (x + 16y)(x + 2y)$$

Factors of 32  $\&$  add up equal 18 = 16 + 2  
^  
16 2

$$\text{Try1) } x^2 + 29x + 100 = (x + 25)(x + 4)$$

$$\text{Try2) } x^2 - 11xy + 24y^2 = (x - 8y)(x - 3y)$$

## Factoring Trinomials when the last sign is “-”

$$\left( \quad + \quad \right) \left( \quad - \quad \right)$$

Factors of the last term & difference gives the middle term.

$$\text{Ex6) } x^2 + 4x - 12 = (X + 6)(X - 2)$$

12  
^  
+6 -2

Note: the bigger # follows the middle term sign.

$$\text{Ex7) } x^2 + 6x - 72 = (X + 12)(X - 6)$$

72  
^  
-6 +12

$$\text{Ex8) } x^2 - 3x - 18 = (x - 6)(x + 3)$$

$$\begin{array}{c} 18 \\ \wedge \\ +3 -6 \end{array}$$

$$\text{Ex9) } x^2 - 9xy - 36y^2 = (x - 12y)(x + 3y)$$

$$\begin{array}{c} 36 \\ \wedge \\ +3 -12 \end{array}$$

$$\text{Try1) } x^2 + 2x - 15 = (x + 5)(x - 3)$$

$$\text{Try2) } x^2 - 6xy - 27y^2 = (x - 9y)(x + 3y)$$

$$\text{or } (x + 3y)(x - 9y)$$