

# Completing the Square

$$\left. \begin{array}{l} x^2 + 8x + 7 = 0 \\ (x+4)^2 - 9 = 0 \end{array} \right\} \text{These are actually the same!}$$

check

$$\begin{aligned} (x+4)(x+4) - 9 &= 0 \\ x^2 + 8x + 16 - 9 &= 0 \\ x^2 + 8x + 7 &= 0 \checkmark \end{aligned}$$

How to complete the square:

use  
 $(x \quad)^2 = \quad \dots$

Take half of  
the "b" term

Square it  
and subtract  
it on outside

$$\begin{aligned} x^2 + 6x - 2 &= 0 \\ (x \quad)^2 - \quad - 2 &= 0 \\ (x+3)^2 - \underline{9} - 2 &= 0 \\ (x+3)^2 - 11 &= 0 \checkmark \end{aligned}$$

CLT

Complete the Square

①  $x^2 + 8x - 12 = 0$

$$\begin{aligned} (x+4)^2 - 16 - 12 &= 0 \\ (x+4)^2 - 28 &= 0 \end{aligned}$$

check

$$(x+4)(x+4) - 28 = 0$$

$$x^2 + 8x + 16 - 28 = 0$$

$$x^2 + 8x - 12 = 0 \checkmark$$

②  $y = x^2 - 12x + 1$

$$y = (x-6)^2 - 35$$

check

$$y = (x-6)(x-6) - 35$$

$$y = x^2 - 12x + 36 - 35$$

$$y = x^2 - 12x + 1 \checkmark$$

③

$$y = x^2 + 4x - 1$$

$$y = (x+2)^2 - 4 - 1$$

$$y = (x+2)^2 - 5$$