

$$(x-h)^2 = \#$$

$$x^2 + bx + c$$

$$\left(\frac{b}{2}\right)^2 = c$$

Ex 1a

$$x^2 + \underline{12}x + c$$

$$\frac{12}{2} = \underline{6}^2 = 36$$

$$\begin{array}{r} 36 \\ \diagdown \quad \diagup \\ 6 \quad \quad 6 \\ \diagup \quad \diagdown \\ 12 \end{array}$$

$$x^2 + 12x + 36$$

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

$$\underline{(x+6)^2}$$

Ex 1b

$$x^2 - 6x + c$$

$$\frac{-6}{2} = \underline{(-3)}^2 = 9$$

$$x^2 - 6x + 9$$

$$\underline{(x-3)^2}$$

$$\begin{array}{r} 9 \\ \diagdown \quad \diagup \\ -3 \quad \quad -3 \\ \diagup \quad \diagdown \\ -6 \end{array}$$

$$(x-3)(x-3)$$

Ex 2a

$$x^2 - 14x + 49 = 15 + 49$$

$$\frac{-14}{2} = (-7)^2 = 49$$

$$\sqrt{(x-7)^2} = \sqrt{64}$$

$$x - 7 = \pm 8$$

$$\begin{array}{l} x - 7 = 8 \\ +7 \quad +7 \\ \hline x = 15 \end{array}$$

$$\begin{array}{l} x - 7 = -8 \\ +7 \quad +7 \\ \hline x = -1 \end{array}$$

$$x^2 + 10x + 25 = 24 + 25$$

$$\frac{10}{2} = 5^2 = 25$$

$$\sqrt{(x+5)^2} = \sqrt{49}$$

$$x + 5 = \pm 7$$

$$\begin{array}{l} x + 5 = 7 \\ -5 \quad -5 \\ \hline x = 2 \end{array}$$

$$\begin{array}{l} x + 5 = -7 \\ -5 \quad -5 \\ \hline x = -12 \end{array}$$

Ex 3a

$$x^2 - 4x - 21 = 0$$

$$x^2 - 4x + 4 = 21 + 4$$

$$\frac{-4}{2} = (-2)^2 = 4$$

$$\sqrt{(x-2)^2} = \sqrt{25}$$

$$x - 2 = \pm 5$$

$$\begin{array}{l} x - 2 = 5 \\ +2 \quad +2 \end{array}$$

$$x = 7$$

$$\begin{array}{l} x - 2 = -5 \\ +2 \quad +2 \end{array}$$

$$x = -3$$

Ex 3b

$$x^2 - 8x + 16 = -5 + 16$$

$$\frac{-8}{2} = -4 = 16$$

$$\sqrt{(x-4)^2} = \sqrt{11}$$

$$x - 4 = \pm \sqrt{11}$$

OR
 $4 \pm \sqrt{11}$

$$\begin{array}{l} x - 4 = \sqrt{11} \\ +4 \quad +4 \end{array}$$

$$x = 4 + \sqrt{11}$$

$$\begin{array}{l} x - 4 = -\sqrt{11} \\ +4 \quad +4 \end{array}$$

$$x = 4 - \sqrt{11}$$