

Solve:

1a)  $(x-3)^2 = 7$

$$\sqrt{(x-3)^2} = \sqrt{7}$$

$$|x-3| = \sqrt{7}$$

$$\textcircled{+} x-3 = \sqrt{7}$$

$$\begin{array}{cc} +3 & +3 \\ \hline \end{array}$$

$$x = 3 + \sqrt{7}$$

$$\textcircled{-} -(x-3) = \sqrt{7}$$

$$-x+3 = \sqrt{7}$$

$$\begin{array}{cc} -3 & -3 \\ \hline \end{array}$$

$$-x = (-3 + \sqrt{7}) \cdot 1$$

$$x = 3 - \sqrt{7}$$

$$x = 3 \pm \sqrt{7}$$

1b)  $(2x-3)^2 = 7$

$$\sqrt{(2x-3)^2} = \sqrt{7}$$

$$|2x-3| = \sqrt{7}$$

$$2x-3 = \pm \sqrt{7}$$

$$\begin{array}{cc} +3 & +3 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{3 \pm \sqrt{7}}{2}$$

$$x = \frac{3 \pm \sqrt{7}}{2}$$

$$|c) \sqrt{(x+5)^2} = \sqrt{-4}$$

$$|x+5| = 2i$$

$$x+5 = \pm 2i$$

-5      -5

$$x = -5 \pm 2i$$

Ex 2 Solve:

$$x^2 - 6x - 3 = 0$$

+3      +3

$$x^2 - 6x + 9 = 3 + 9$$

$$\sqrt{(x-3)^2} = \sqrt{12}$$

$$|x-3| = 2\sqrt{3}$$

$$x-3 = \pm 2\sqrt{3}$$

+3      +3

$$x = 3 \pm 2\sqrt{3}$$

# Solving $ax^2 + bx + c = 0$ by Completing The Square.

- 1) Move the constant "c" to the right side of the equation (by itself)
- 2) If "a", the quadratic coefficient isn't 1, then divide each term by "a"
- 3) Add to both sides of the equation "b" divided by "2a" quantity squared
- 4) Factor the left side of the equation as a Perfect Square Trinomial.
- 5) Take the square root of both sides of the equation and simplify.

Ex 3 Solve:

$$2y^2 + 2y + 5 = 0$$

$$\frac{2y^2 + 2y}{2} = \frac{-5}{2}$$

$$y^2 + 1y + \frac{1}{4} = \frac{-5}{2} + \frac{1}{4}$$

want a perfect square trinomial

$$\sqrt{\left(y + \frac{1}{2}\right)^2} = \sqrt{\frac{-9}{4}}$$

$$\left|y + \frac{1}{2}\right| = \frac{3i}{2}$$

$$y + \frac{1}{2} = \pm \frac{3i}{2}$$

"Texas 2 Step"  
 $\left(\frac{1}{2}\right)^2$

$$-\frac{1}{2}$$

$$-\frac{1}{2}$$

$$y = -\frac{1}{2} \pm \frac{3}{2}i$$