

### HW: Complete the Square

1.)  $x^2 + 14x + 5 = 0$

	$x$	$+7$	
$0 = x$	$x^2$	$+7x$	$5$
	$+7$	$+7x$	$+49$
			$-49$

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

$$0 = (x+7)^2 - 44$$

$$+44 \qquad +44$$

$$\sqrt{44} = \sqrt{(x+7)^2}$$

$$\pm\sqrt{44} = x+7$$

$$\begin{array}{r} -7 \\ -7 \end{array} \qquad \begin{array}{r} -7 \\ -7 \end{array}$$

$$-7 \pm \sqrt{44} = x$$

$$-7 \pm 2\sqrt{11} = x$$

$$\begin{array}{r} * \sqrt{44} \\ \sqrt{4 \cdot 11} \\ 2\sqrt{11} \end{array}$$

$$-7 \pm \sqrt{44} = x$$

$$-7 \pm 2\sqrt{11} = x$$

2.)  $x^2 - 8x - 10 = 0$

	$x^2$	$-8x$	$-10$
	$+16$		$+16$

$$\left(\frac{-8}{2}\right)^2 = (-4)^2 = 16$$

$$\sqrt{(x-4)^2} = \sqrt{26}$$

$$x-4 = \pm\sqrt{26}$$

$$\begin{array}{r} +4 \\ +4 \end{array}$$

$$x = 4 \pm \sqrt{26}$$

3.)  $x^2 + 4x - 3 = 0$

	$x$	$+2$	
$0 = x$	$x^2$	$+2x$	$-3$
	$+2$	$+2x$	$+4$
			$-4$

$$0 = (x+2)^2 - 7$$

$$+7 \qquad +7$$

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

$$\pm\sqrt{7} = x+2$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

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

$$\left(\frac{b}{2}\right)^2 = \left(\frac{-2}{2}\right)^2 - (-1)^2 = 1$$

$$4.) x^2 - 2x - 20 = 0$$

$$x^2 - 2x + 1 = 20 + 1$$

$$\sqrt{(x-1)^2} = \sqrt{21}$$

$$x - 1 = \pm \sqrt{21}$$

$$\begin{matrix} +1 & +1 \\ \hline x = 1 \pm \sqrt{21} \end{matrix}$$

$$5.) x^2 - 12x = 3$$

$$\left(\frac{-12}{2}\right)^2 = (-6)^2 = 36$$

$$x^2 - 12x - 3 = 0$$

x	-6		
0 = x	x <sup>2</sup>	-6x	-3
	-6	-6x + 36	36

$$0 = (x-6)^2 - 39$$

$$+39 \qquad +39$$

$$\sqrt{39} = \sqrt{(x-6)^2}$$

$$\pm \sqrt{39} = x - 6$$

$$\begin{matrix} +6 & +6 \\ \hline 6 \pm \sqrt{39} = x \end{matrix}$$

$$6.) x^2 + 10x = -7$$

$$\left(\frac{10}{2}\right)^2 = 5^2 = 25$$

$$x^2 + 10x + 25 = -7 + 25$$

$$\sqrt{(x+5)^2} = \sqrt{18}$$

$$x + 5 = \pm \sqrt{18}$$

$$\begin{matrix} -5 & -5 \\ \hline x = -5 \pm \sqrt{18} \\ x = -5 \pm 3\sqrt{2} \end{matrix}$$

Simplify

$$\begin{matrix} * \sqrt{18} \\ \sqrt{9 \cdot 2} \\ 3\sqrt{2} \end{matrix}$$