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HW: Complete the Square

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

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

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

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

$+44 \quad +44$

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

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

$-7 \quad -7$

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

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

$*\sqrt{44}$

$\sqrt{4}\cdot\sqrt{11}$

$2\sqrt{11}$

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

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

$x^2-8x\ \boxed{+16}=10\ \boxed{+16}$

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

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

$+4 \quad +4$

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

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

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

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

$+7 \quad +7$

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

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

$-2 \quad -2$

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

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

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

$x^2 - 2x \boxed{+1} = 20 \boxed{+1}$

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

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

$+1 \quad +1$

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

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

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

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

	x	-6	
$0 =$	x	x^2	$-6x$	-3
	-6	$-6x$	$+36$	$\boxed{-36}$

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

$+39 \quad +39$

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

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

$+6 \quad +6$

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

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

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

$x^2 + 10x \boxed{+25} = -7 \boxed{+25}$

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

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

$-5 \quad -5$

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

$x = -5 \pm 3\sqrt{2}$

Simplify

* $\sqrt{18}$

$\sqrt{9 \cdot 2}$

$3\sqrt{2}$