Steps to follow when solving by Completing the Square:

1. Get the equation into the following form: $x^2 + bx = c$
2. Complete the square so the equation becomes: $(x - h)^2 = k$
3. Solve for x using Square Roots.

$ax^2 + bx = c$

To solve by completing the square you MUST have

$a = 1$

Solving by completing the square is easiest if:

b is even

Solve by Completing the Square. $x^2 + 14x - 3 = 0$

$x^2 + 14x - 3 = 0$

$+3 \quad +3$

$x^2 + 14x + 49 = 3 + 49$

Complete the square $(x+7)^2$

$\sqrt{(x+7)^2} = \sqrt{52} = \sqrt{4 \cdot 13}$

$x + 7 = \pm 2\sqrt{13}$

$-7 \quad -7$

$x = -7 \pm 2\sqrt{13}$

Solve by Completing the Square. $x^2 - 20x + 7 = 0$

$x^2 - 20x + 7 = 0$

$-7 \quad -7$

$x^2 - 20x + 100 = -7 + 100$

Complete the square $(x-10)^2$

$\sqrt{(x-10)^2} = \sqrt{93}$

$x - 10 = \pm\sqrt{93}$

$+10 \quad +10$

$x = 10 \pm \sqrt{93}$

Solve by Completing the Square. $2x^2 - 36x + 10 = 0$

$2x^2 - 36x + 10 = 0$

$-10 \quad -10$

$\frac{2x^2 - 36x}{2} = \frac{-10}{2}$

$x^2 - 18x \underline{+81} = -5 + 81$

Complete the square: $(x-9)^2$

$\sqrt{(x-9)^2} = \sqrt{76} \rightarrow \sqrt{4 \cdot 19}$

$x - 9 = \pm 2\sqrt{19}$

$+9 \quad +9$

$x = 9 \pm 2\sqrt{19}$

Solve by Completing the Square. $x^2 + 21 = -10x$

$x^2 + 21 = -10x$

$x^2 + 10x \underline{+25} = -21 + 25$

Complete the square: $(x+5)^2$

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

$x + 5 = \pm 2$

$x = -3, -7$

$+2 - 5 \quad -2 - 5$

Solve by Completing the Square. $x^2 - 6x + 23 = 0$

$x^2 - 6x + 23 = 0$

$-23 \quad -23$

$x^2 - 6x \underline{+9} = -23 + 9$

Complete the square: $(x-3)^2$

$\sqrt{(x-3)^2} = \sqrt{-14}$

$x - 3 = \pm i\sqrt{14}$

$+3 \quad +3$

$x = 3 \pm i\sqrt{14}$

Solve this equation using any method.

$x^2 + 2x - 1763 = 0$

$x^2 + 2x - 1763 = 0$

-1763

$+43 \quad -41$

$+2$

$(x+43)(x-41) = 0$

$x = 41, -43$

$x^2 + 2x - 1763 = 0$

$+1763 \quad +1763$

$x^2 + 2x \underline{+1} = +1763 + 1$

Complete the square: $(x+1)^2$

$\sqrt{(x+1)^2} = \sqrt{1764}$

$x + 1 = \pm 42$

$-1 \quad -1$

$x = 41, -43$

$+42 - 1 \quad -42 - 1$

Rewrite this equation into Vertex Form:

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

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

$+7 \qquad +7$

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

$(x+5)^2$ complete the square

$y + 32 = (x+5)^2$

$-32 \qquad -32$

$y = (x+5)^2 - 32$

Rewrite this equation into Vertex Form:

$y = x^2 - 6x + 1$

$y = x^2 - 6x + 1$

$-1 \qquad -1$

$y - 1 + 9 = x^2 - 6x + 9$

$(x-3)^2$ complete the square

$y + 8 = (x-3)^2$

$-8 \qquad -8$

$y = (x-3)^2 - 8$

Rewrite this equation into Vertex Form:

$y = 2x^2 - 12x - 11$

$y = 2x^2 - 12x - 11$

$+11 \qquad +11$

$\frac{y+11}{2} = \frac{2x^2 - 12x}{2}$

$\frac{y+11}{2} + 9 = x^2 - 6x + 9$

$(x-3)^2$ complete the square

$\frac{y+11}{2} + 9 = (x-3)^2$

$-9 \qquad -9$

$2\left(\frac{y+11}{2}\right) = \left[(x-3)^2 - 9\right]2$

$y + 11 = 2(x-3)^2 - 18$

$-11 \qquad -11$

$y = 2(x-3)^2 - 29$

You can now finish Hwk #17

Sec 5-7

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Problems: 7-9, 15-18, 31-32