

Name: _____
 Date: _____
 Class: _____

Algebra
 Unit 10
 HW 10-2

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

$$\begin{array}{r} x-2 = \pm 5 \\ +2 \quad +2 \\ \hline x = 2 \pm 5 \end{array} \rightarrow \begin{array}{l} 2+5 = 7 \\ 2-5 = -3 \end{array}$$

2) Solve: $2(x+5)^2 - 50 = 150$

$$\begin{array}{r} 2(x+5)^2 - 50 = 150 \\ +50 \quad +50 \\ \hline 2(x+5)^2 = 200 \\ \frac{2}{2} \quad \frac{2}{2} \\ \hline (x+5)^2 = 100 \\ \sqrt{\quad} \quad \sqrt{\quad} \\ \hline x+5 = \pm 10 \\ -5 \quad -5 \\ \hline x = -5 \pm 10 \\ -5 + 10 = 5 \\ -5 - 10 = -15 \end{array}$$

3) Solve: $(x-3)^2 + 10 = 38$

$$\begin{array}{r} (x-3)^2 + 10 = 38 \\ -10 \quad -10 \\ \hline (x-3)^2 = 28 \\ \sqrt{\quad} \quad \sqrt{\quad} \\ \hline x-3 = \pm \sqrt{28} \\ +3 \quad +3 \\ \hline x = 3 \pm \sqrt{28} \end{array} \rightarrow \begin{array}{l} \sqrt{4} \sqrt{7} \\ 2\sqrt{7} \\ \hline x = 3 \pm 2\sqrt{7} \end{array}$$

4) Solve using complete the square: $x^2 + 8x - 2 = 0$

$$\begin{array}{r} x^2 + 8x - 2 = 0 \\ +2 \quad +2 \\ \hline x^2 + 8x + 16 = 2 + 16 \\ +8 \quad +8 \\ \frac{+8}{2} = (4)^2 = +16 \\ \hline (x+4)^2 = 18 \\ \sqrt{\quad} \quad \sqrt{\quad} \\ \hline x+4 = \pm \sqrt{18} \\ -4 \quad -4 \\ \hline x = -4 \pm \sqrt{18} \end{array} \rightarrow \begin{array}{l} \sqrt{9} \sqrt{2} \\ 3\sqrt{2} \\ \hline x = -4 \pm 3\sqrt{2} \end{array}$$

5) Find the zeros of this function using complete the square: $y = x^2 - 4x - 2$

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

$$2 = x^2 - 4x$$

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

$$6 = x^2 - 4x + 4$$

$$\pm\sqrt{6} = x - 2$$

$$2 \pm \sqrt{6} = x$$

6) Solve using complete the square: $2x^2 - 8x - 3 = 5x^2 + 4x + 7$

$$-2x^2 + 8x - 7 = -2x^2 + 8x - 7$$

$$\frac{10}{3} = \frac{3x^2 + 12x}{3}$$

$$\frac{10}{3} = x^2 + 4x$$

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

$$\frac{22}{3} = (x+2)^2$$

$$\pm\sqrt{\frac{22}{3}} = x + 2$$

$$-2 \pm \sqrt{\frac{22}{3}} = x$$

7) Find the solution to the system using complete the square:
 $f(x) = 3x^2 + 2x + 45$ and $h(x) = 2x^2 - 10x + 33$.

$$3x^2 + 2x + 45 = 2x^2 - 10x + 33$$

$$-2x^2 + 10x - 45 = -2x^2 + 10x - 45$$

$$x^2 + 12x + 36 = -12 + 36$$

$$\frac{+12}{2} = (+6)^2 = +36$$

$$\sqrt{(x+6)^2} = \sqrt{24}$$

$$x + 6 = \pm\sqrt{24}$$

$$x = -6 \pm \sqrt{24}$$

* need y values

$$-6 + \sqrt{24} = -1.1 = x$$

$$-6 - \sqrt{24} = -10.9 = x$$

y values

$$3(-1.1)^2 + 2(-1.1) + 45$$

$$y \rightarrow 46.43$$

$$(-1.1, 46.43)$$

$$3(-10.9)^2 + 2(-10.9) + 45$$

$$y \rightarrow 379.63$$

$$(-10.9, 379.63)$$