Panel 1

Lesson 7.9- SWBAT solve quadratic and linear systems.

Kick off-
Solve each of the following by factoring:

1) $x^2 + 12 = -8x$

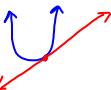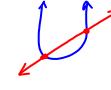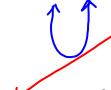$$x^2 + 8x + 12 = 0 \qquad \text{MP: } 12x^2$$
$$(x^2 + 6x)(2x + 12) = 0 \qquad 6x \quad 2x$$
$$x(x+6) + 2(x+6) = 0$$
$$(x+2)(x+6) = 0$$

2)
$$x^2 = 64$$
$$\underline{-64 \quad -64}$$
$$x^2 - 64 = 0$$
$$(x-8)(x+8) = 0$$
$$x-8 = 0 \qquad x+8 = 0$$
$$+8 +8 \qquad -8 -8$$
$$\boxed{x = 8} \quad \boxed{x = -8}$$

3) Solve by completing the square: $x^2 - 4x - 6 = 0$

$$ax^2 + bx = c$$
$$x^2 - 4x - 6 = 0$$
$$\underline{+6 \quad +6}$$
$$x^2 - 4x = 6$$
$$x^2 - 4x + 4 = 6 + 4$$
$$(x-2)(x-2) = 10$$
$$\sqrt{(x-2)^2} = \sqrt{10}$$
$$x - 2 = \pm\sqrt{10}$$
$$+2 \quad +2 \qquad \boxed{x = 2 \pm \sqrt{10}}$$

$$\left(\tfrac{1}{2}b\right)^2 \text{ add to both sides}$$
$$\left(\tfrac{1}{2}(-4)\right)$$
$$(-2)^2 = 4$$

Panel 2

Linear and Quadratic Systems

3 Kinds of Solutions:

one solution   two solution   no solution

Steps to Solve a Linear and Quadratic System
1) Put each equation equal to y
2) Set each equation equal to each other
3) Solve for x.
4) Substitute the value for x back in and solve for y
5) Check solutions!

Ex: $y = x^2 + x - 4$
$\quad y = 2x - 2$

(must be a point) (x, y)

$$x^2 + x - 4 = 2x - 2$$
$$\underline{-2x + 2 \quad -2x + 2}$$

MP: $\boxed{1x^2}\boxed{-2}$

$$\boxed{1x^2 \cdot x - 2 = 0}$$
$$-2x^2$$
$$-2x +1$$
$$(x^2 - 2)(1x - 2) = 0$$
$$x(x-2) + 1(x-2) = 0$$
$$(x+1)(x-2) = 0$$
$$x+1 = 0 \qquad x - 2 = 0$$
$$-1 -1 \qquad +2 +2$$
$$\boxed{x = -1} \quad \boxed{x = 2}$$
$$\boxed{y = -4} \quad \boxed{y = 2}$$

#1
$$y = 2x - 2$$
$$y = 2(-1) - 2$$
$$-4 = -2 - 2$$

#2
$$y = 2x - 2$$
$$y = 2(2) - 2$$
$$y = 2$$

$$(-1, -4) \qquad (2, 2)$$

Panel 3

Directions: Solve each of the systems.

1) Solve by factoring: $y = x^2 - 4x + 3$
$\qquad\qquad\qquad\qquad y = x - 1$

Panel 4

2) Solve by quadratic formula: $y = x^2 - x - 6$
$\qquad\qquad\qquad\qquad\qquad y - 2x = -2$
$\qquad\qquad\qquad\qquad\qquad \underline{+2x +2x}$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad y = 2x - 2$$

Panel 5

3) Solve by completing the square: $y = x^2 + 4x + 1$
$\qquad\qquad\qquad\qquad\qquad\qquad y = 2x + 1$

$$x^2 + 4x + 1 = 2x + 1$$
$$\underline{-2x - 1 \quad -2x - 1}$$
$$x^2 + 2x + 1 = 0 + 1 \qquad \tfrac{1}{2}(2) = \boxed{1}^2 = 1$$
$$x^2 + 2x + 1 = 1$$
$$(x+1)(x+1) = 1 \qquad y = 2x + 1$$
$$\sqrt{(x+1)^2} = \sqrt{1} \qquad x = 0 \qquad x = -2$$
$$x + 1 = \pm 1 \qquad 2(0) + 1 \qquad 2(-2) + 1$$
$$\qquad\qquad\qquad\qquad 1 \qquad\qquad -3$$

$$x + 1 = 1 \qquad x + 1 = -1$$
$$\underline{-1 -1} \qquad \underline{-1 -1}$$
$$x = 0 \qquad x = -2$$

$$\boxed{(0, 1)} \qquad \boxed{(-2, -3)}$$

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