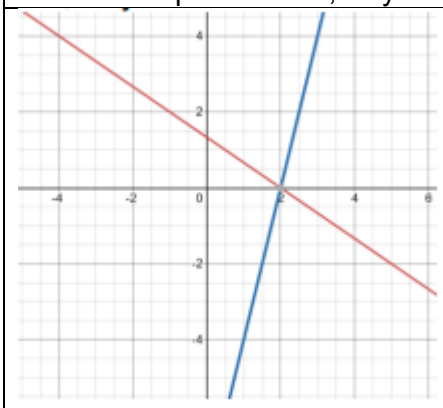
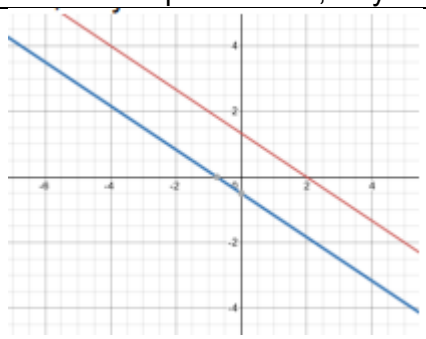
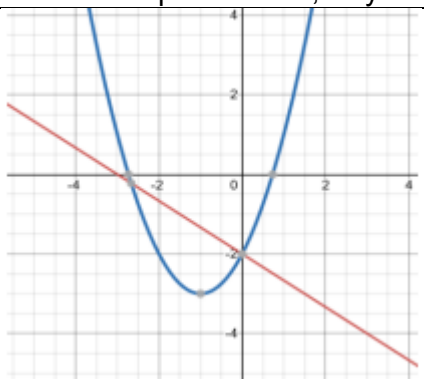
Name: _____ Date: _____ Period: _____

_____ **Systems with Quadratics**

Activator: *Harmony of Functions Diagnostic*

1. Is there a point of intersection on the following graph? If so, what is that point? If not, why?	**2.** Is there a point of intersection on the following graph? If so, what is that point? If not, why?	**3.** Is there a point of intersection on the following graph? If so, what is that point? If not, why?
		

Explore: *Solving Systems of Quadratic & Linear Equations Desmos Activity*

Record your systems to Slides 9-12 below.

Create a system using one Quadratic equation and one linear equation with exactly one solution.	Create a system using two quadratic equations with exactly one solution.	Create a system using one Quadratic equation and one linear equation with exactly two solutions.	Create a system using two quadratic equations with exactly two solutions.

In order to solve these systems algebraically, we must review solving equations.

Solving Quadratic Equations

Graphic Organizer

The three forms of a Quadratic Equation are :

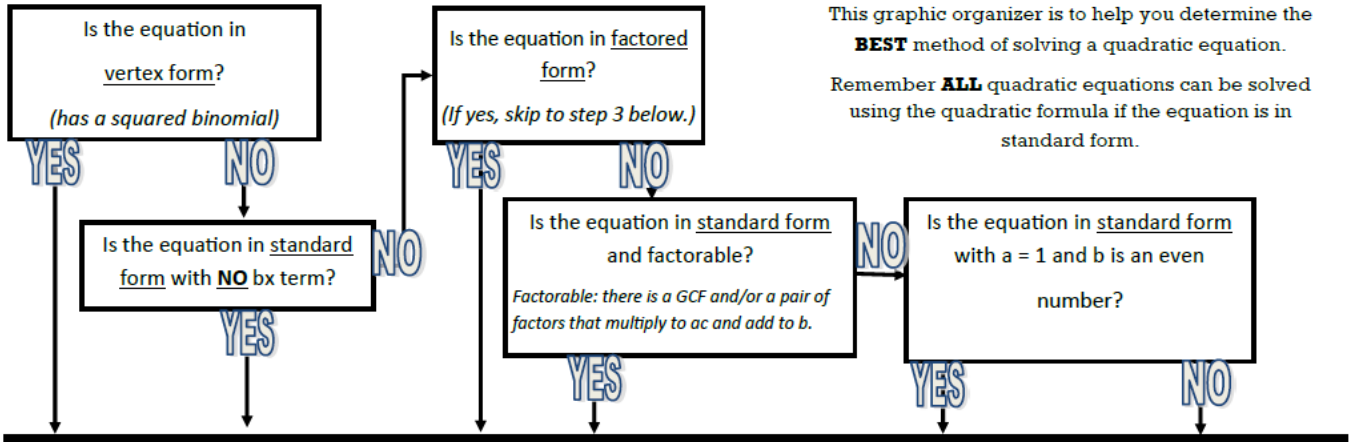
1 Standard Form $ax^2 + bx + c = 0$

2 Vertex Form $a(x-h)^2 + k = 0$

3 Factored Form $a(x-p)(x-q) = 0$

This graphic organizer is to help you determine the **BEST** method of solving a quadratic equation.

Remember **ALL** quadratic equations can be solved using the quadratic formula if the equation is in standard form.



Solve by Square Roots

Steps

1. Isolate the x^2 or the $(x-h)^2$.
2. Take the square root of both sides.
3. There will always be a positive and negative answer (±).
4. If necessary, solve for x and simplify any radicals

Solve by Factoring

Steps

1. Be sure the equation is in standard form equal to zero.
2. Factor. Remember to check for GCF first.
3. Use the Zero Product Property (set each factor equal to zero.
4. Solve each equation.

Solve by Completing the Square

Steps

1. Write in the form $x^2 + bx = -c$
2. Complete the square. (Half b, square it and add this number to both sides).
3. Factor the PST on the left, combine like terms on the right.
4. Square root both sides.
5. Solve for x and simplify any radicals.

Solve by Quadratic Formula

Steps

1. Be sure the equation is in standard form equal to zero.
2. Substitute values a, b, and c into the quadratic formula.

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

3. Simplify the discriminant, radical then fraction in that order.

Practice:

4. Solve the system using substitution method. State the solution(s) as ordered pairs. $\begin{cases} x + y = 5 \\ y + 1 = 3x^2 + 2x \end{cases}$	**5.** Solve the system using substitution method. State the solution(s) as ordered pairs. $\begin{cases} y = x^2 + 5x - 2 \\ y = 3x - 2 \end{cases}$