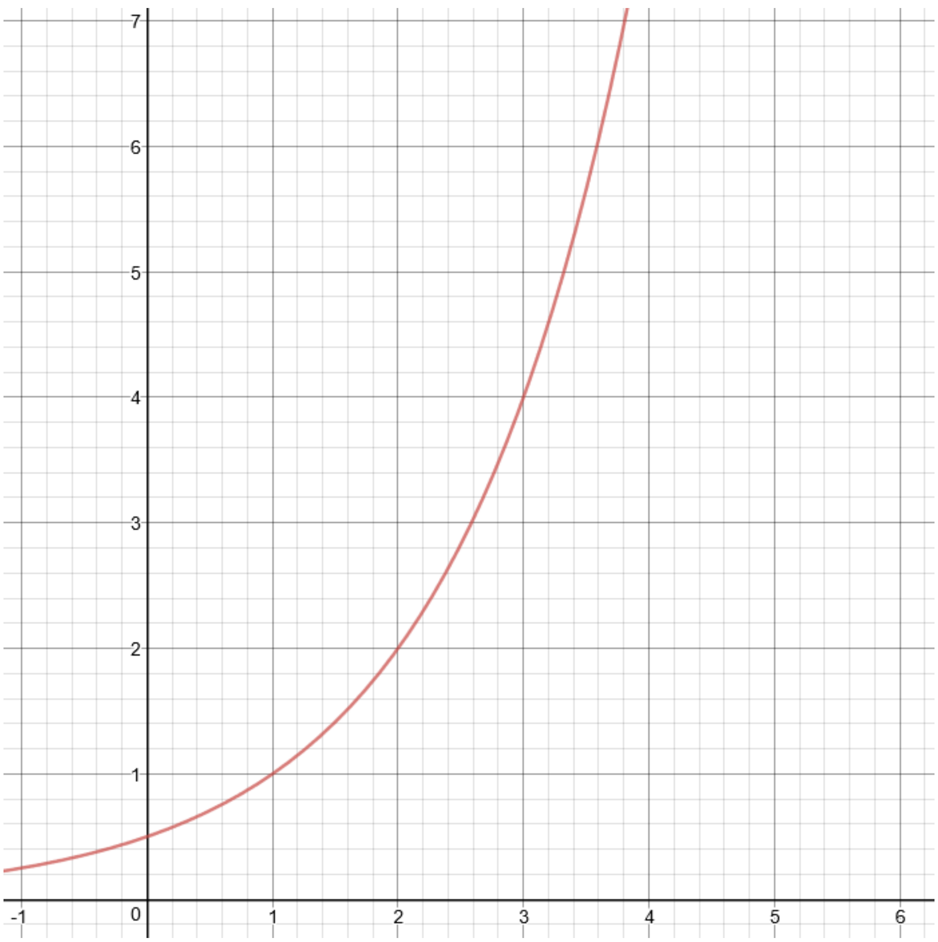
CH.5, L1 – GRAPHICAL SOLUTIONS TO SYSTEMS OF EQUATIONS

Objective: Given a system of functions, I will graph and interpret the intersection of two functions as $f(x) = g(x)$ and graphically justify when a system has infinite or no solution.

Think About It: The function $f(x) = \frac{1}{2}(2)^x$ is graphed below. If $g(x) = -\frac{2}{3}x + 6$, graphically show where $f(x) = g(x)$. Prove your answer is correct by substituting the point into each function.



Key Point #1:

The _____________ to a __________ of equations is the _________ of intersection when ______ functions are graphed ___________.

Keywords: *point, satisfies*

Big Idea:

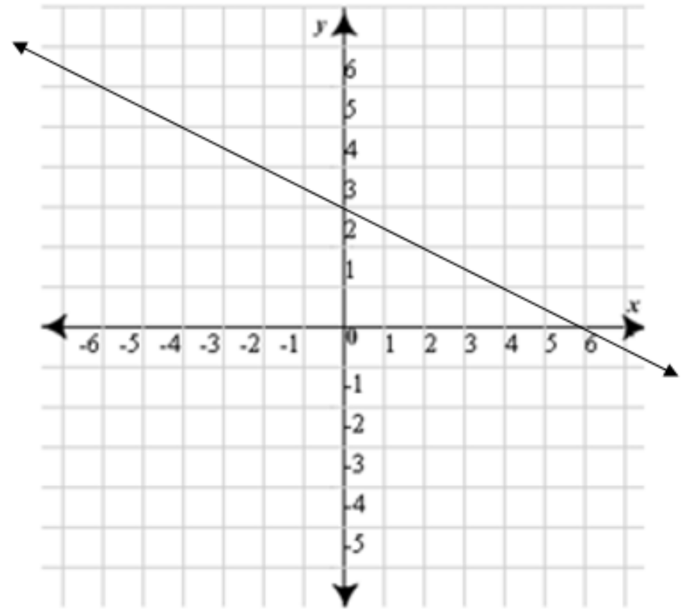
CFS:

1. System is graphed and labeled on the same coordinate grid
2. Number of solutions is determined and justified
3. Solution is checked when it exists

Interaction with New Material:

Ex. 1) For each of the equations below, determine the number of solutions that exist when in a system with the linear function already graphed in the coordinate plane. If one solution exists, determine the solution and check it.

a. $x + 2y = 6$



b. $2x + y = 6$

c. $2y = -x - 6$

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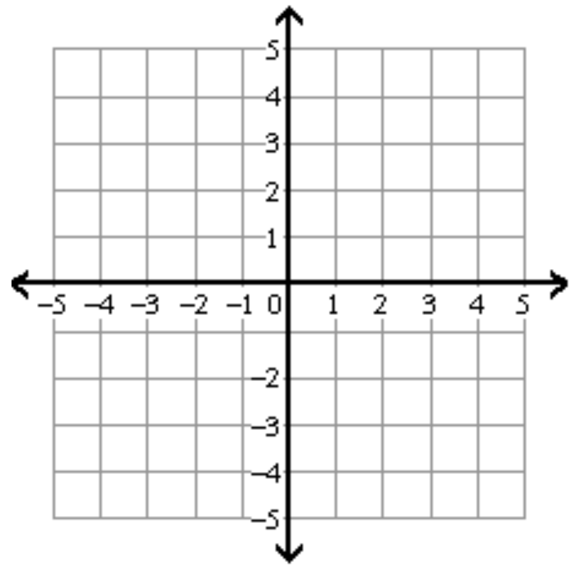
Integrated Math I Name: ____ Period: ______ Date: ____________

Partner Practice:

1. Solve the system of equations graphically and prove the solution is correct with substitution.

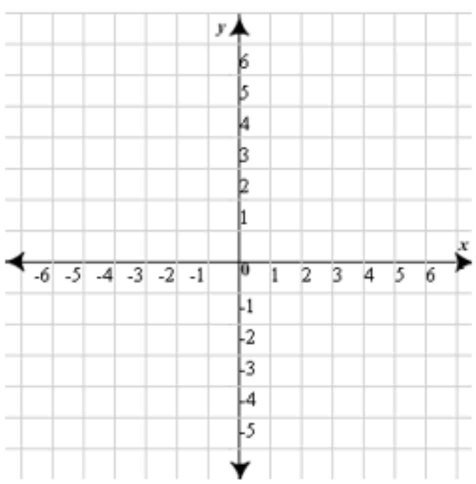
$$\begin{cases} y = \frac{5}{2}x - 2 \\ y = \frac{1}{2}x + 2 \end{cases}$$



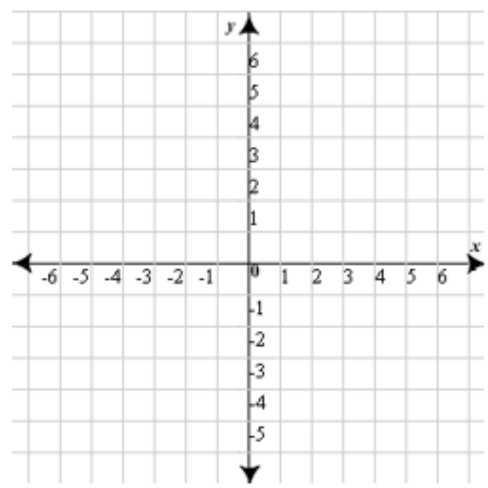
Check:

2. For the two systems below, determine the number of solutions graphically.

$$\begin{cases} y = -2x + 2 \\ y = -2x - 2 \end{cases}$$



$$\begin{cases} y = \frac{6}{2}x - 4 \\ y = 3x - 4 \end{cases}$$



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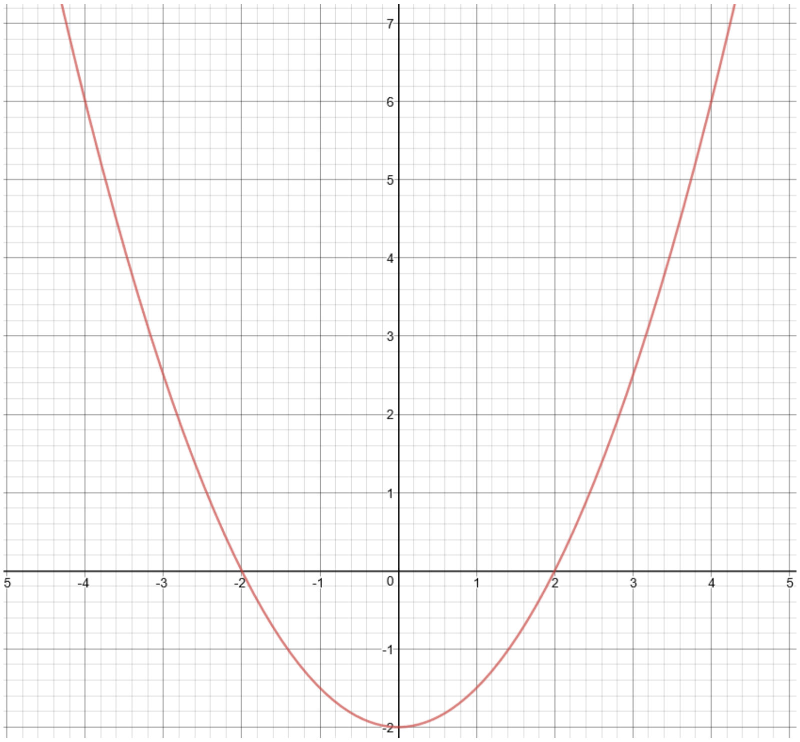
3. The function $g(x)$ is graphed below with the corresponding equation $g(x) = \frac{1}{2}x^2 - 2$. Determine all the solutions that will satisfy $g(x) = h(x)$ and verify they are correct if $h(x) = x + 2$.



Check:

4. Which of the following *best* describes the graph of this system of equations. Explain your reasoning and justify your choice.

$$\begin{cases} y = -2x + 3 \\ 5y = -10x + 15 \end{cases}$$

a) two identical lines

b) two parallel lines

c) two lines intersecting in only one point

d) two lines intersecting in only two points

____

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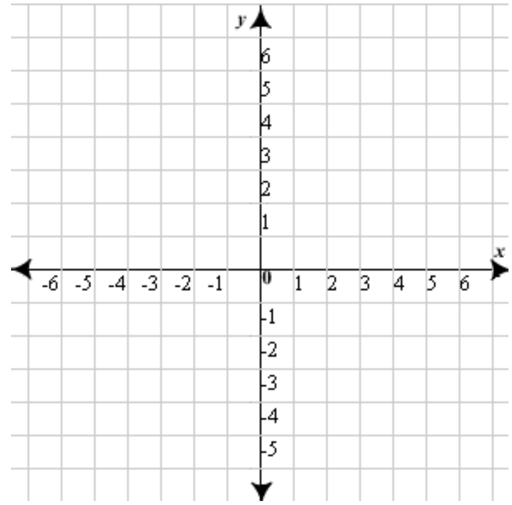
5. Mark claims that $(3, -3)$ is the solution to the system of equations below. Is he correct? Justify your answer.

$$\begin{cases} y = -2x + 3 \\ 6x + 3y = 9 \end{cases}$$



Check:

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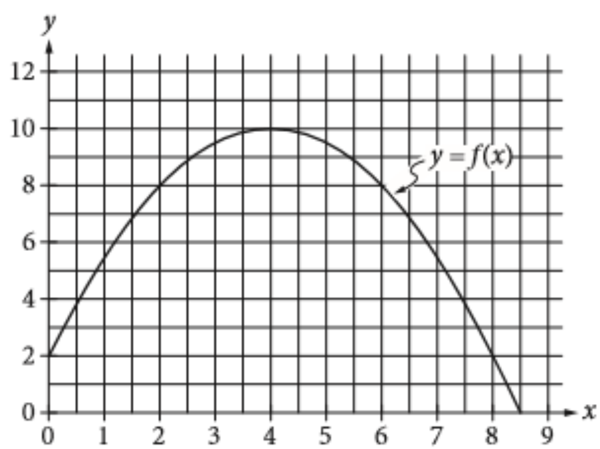
6. SAT Problem!



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Check:

The graph of the function f, defined by $f(x) = -\frac{1}{2}(x-4)^2 + 10$, is shown in the xy-plane above. If the function g (not shown) is defined by $g(x) = -x + 10$, what is one possible value of a such that $f(a) = g(a)$?

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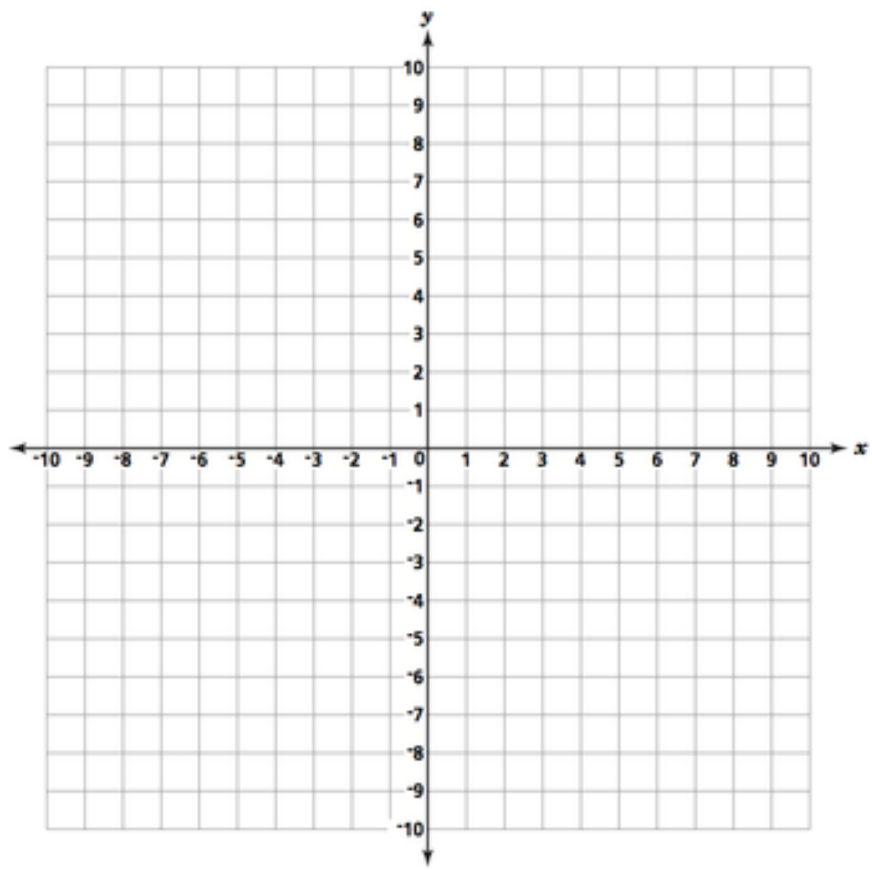
7. Write three generalized rules for being able to determine if a system will have one, no, or an infinite number of solutions just by looking at the equations and not graphing.

8. Without graphing, write three different equations in point-slope form that would have one, no, and an infinite number of solutions when in a system with the equation $2y - 5x = 6$. Once you have determined the equations, graph and check that they satisfy the constraints.



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