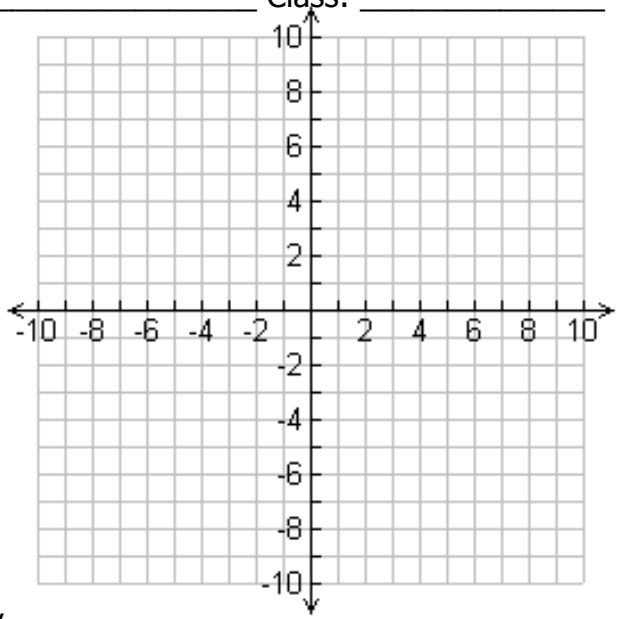
P.S. #12.4 - Systems of Equations

Name: _____ Class: _____

1.) Solve the following system of equations graphically.

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

$x + y = 4$



2.) Solve the following system of equations algebraically.

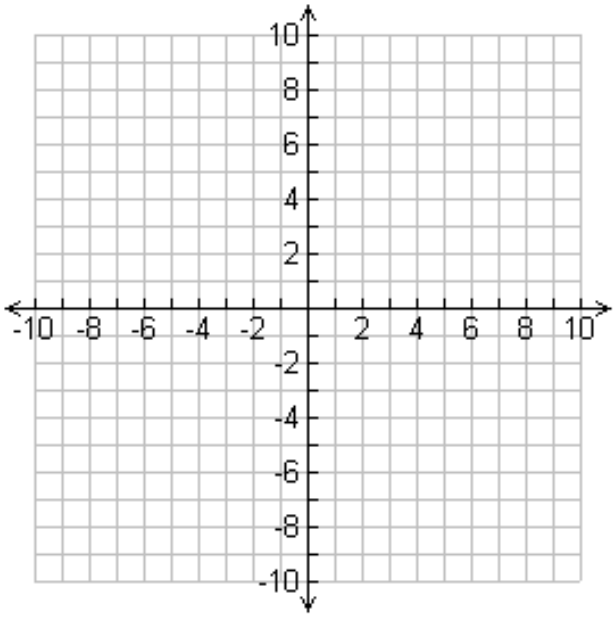
$y = -x^2 + 2x + 4$

$x + y = 4$

3.) Consider the function $h(x) = \frac{1}{2}x^2 + 4x + 1$.

a.) Rewrite the function in vertex form.

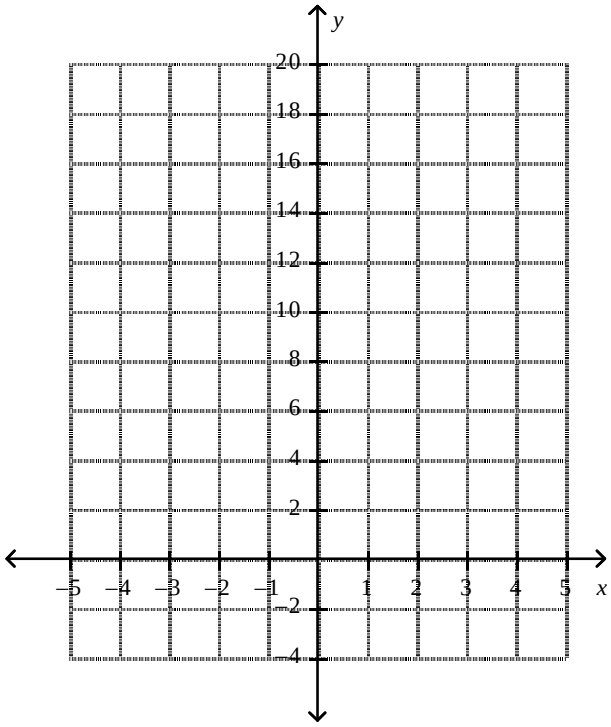
b.) Using your knowledge of transformations of functions, graph the function.



4.) Complete the tables below, for the functions $f(n)=2^n$ and $g(n)=2n$ and then graph the points $(n, f(n))$ on a coordinate plane for each of the formulas.

n	$f(n)=2n$
-2	
-1	
0	
1	
2	
3	

n	$f(n)=2^n$
-2	
-1	
0	
1	
2	
3	

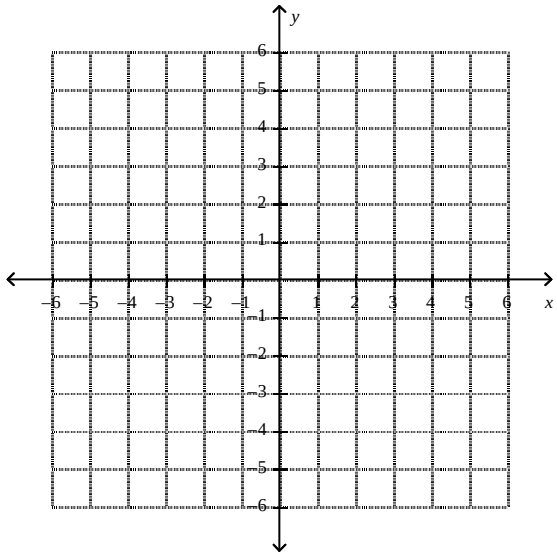


Describe the change in each sequence when n increases by 1 unit.

Find all values of n for which $f(n)=g(n)$.

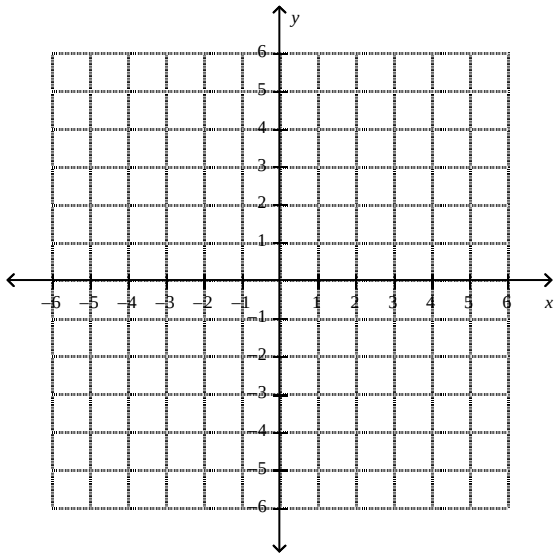
5.) Solve the following system of equations graphically. Use the graphing calculator to help you find the solutions.

$$\begin{cases} f(x) = 2 \cdot (1.5)^x \\ g(x) = 2 + 1.5x \end{cases}$$



6.) What is the solution to the following system of equations?

$$\begin{cases} y = 1.5^x \\ y = -2x + 4 \end{cases}$$



What is the average rate of change for each function from $-2 \le x \le -1$?

What is the average rate of change for each function from $3 \le x \le 5$?

7.) **Estimated Female Population of the United States**

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Population in millions	129	130.6	132	133.3	134.5	135.7	137	138.2	139.4	143.4

a.) Use the statistical features of your calculator to construct a scatter plot and fit a *linear* function to the data. Calculate and interpret the correlation coefficient.

b.) Use the statistical features of your calculator to construct a scatter plot and fit an *exponential* function to the data. Calculate and interpret the correlation coefficient.

c.) Which regression provides the more appropriate model for the data set? Explain.

d.) Compare the growth rates of the two functions

e.) Using both **functions** project the population in the year 2050.