CW#____ Name:_____

Periods: A1 A2 A3 B1 B3

5.2.4 How can I transform log functions?

Transformations of Logarithmic Functions

#85 SOLVE THE LOG MYSTERY!

Your Task: What is the base of the LOG key on your calculator? With your team, start by making a table for $y = \log(x)$. Analyze the points in your table, and when you are sure you have figured out the base, write a clear statement justifying your conclusion.

x	
y	

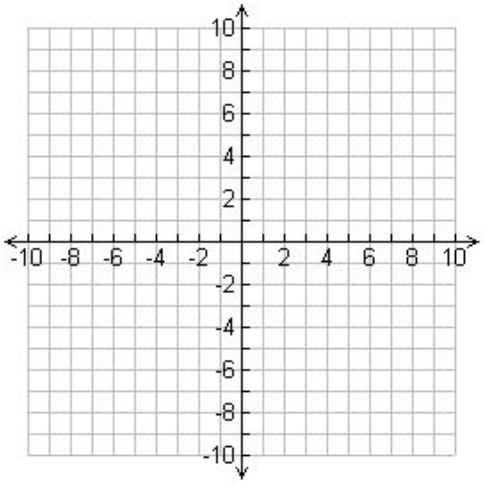
The base of LOG is _____. I know this because

#86

a. Complete the following table for $f(x) = \log(x)$.

x								1	2	3	4	5	6
$f(x)$	-6	-5	-4	-3	-2	-1	0						

b. Make an accurate graph of $f(x) = \log(x)$. Remember that just like the graphs of exponential, the graphs of log functions have asymptotes, so make sure any asymptotes on your graph are clearly shown.

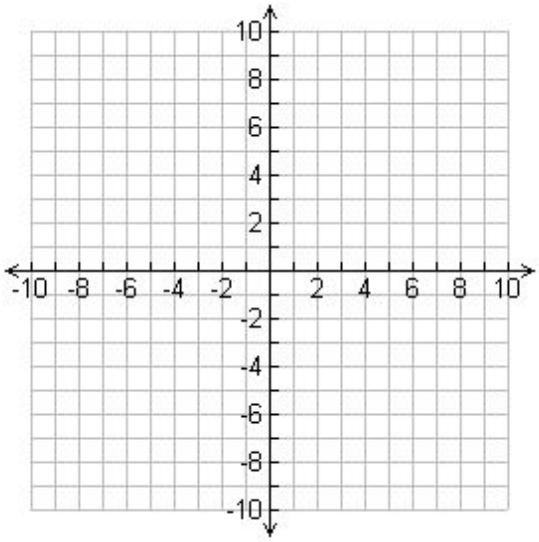


#87 Continued

c. What are all of the possible types of transformations of the graph of $f(x) = \log(x)$? For each transformation, show the graph and write its equation.

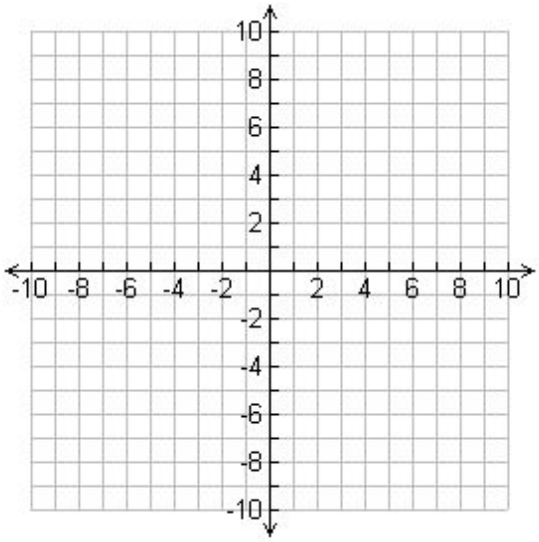
Shift Left or Right

Equatio



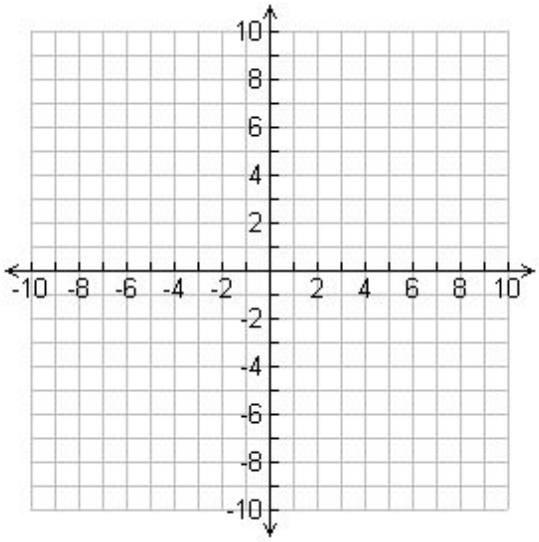
Shift Up or Down

Equation:



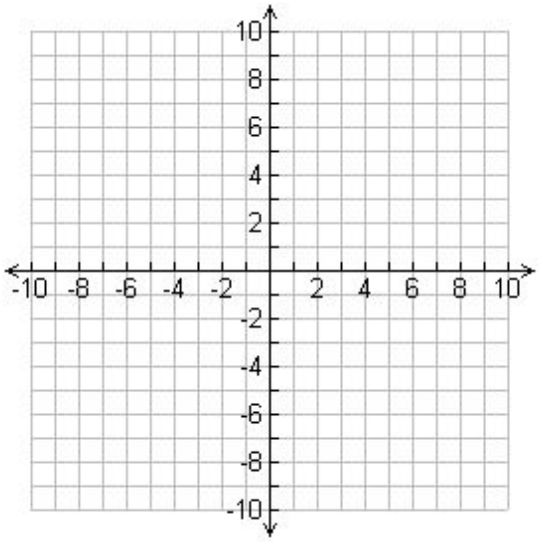
Reflection across x-axis

Equation:



Vertical Stretch or compression

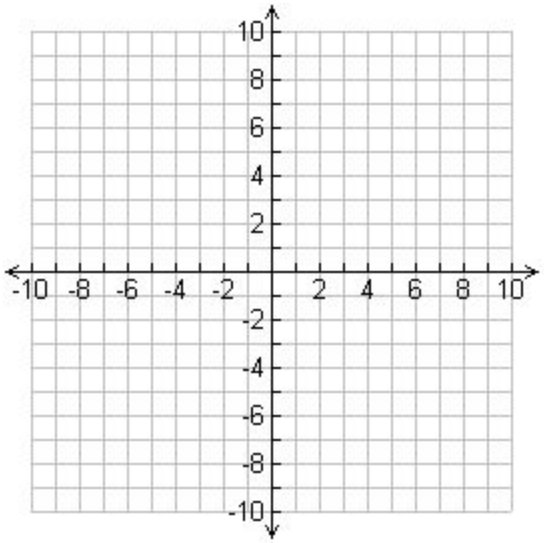
Equation:



Write a generic equation for a transformation for the family of Logs (HINT: This is like graphing for all the other functions you know. It should have an *a, h,* and *k.*)

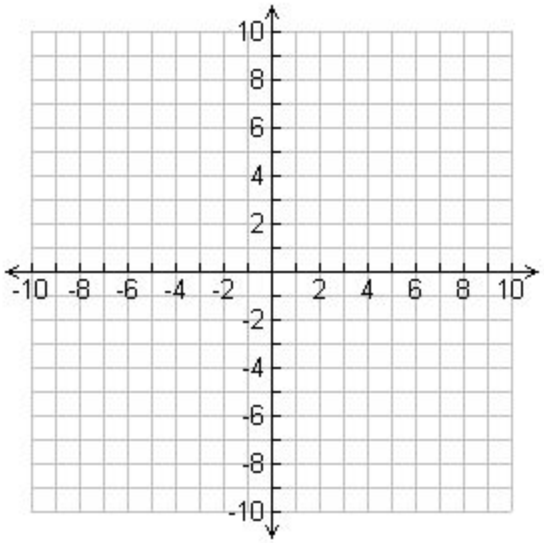
#87 Sketch a graph of each of the following logarithmic functions without using your graphing calculator. Explain how each graph differs from the parent graph of $f(x) = \log(x)$. Once you have completed your work, verify that your graphs are correct using your graphing calculator.

a. $f_1(x) = \log(x) + 3$



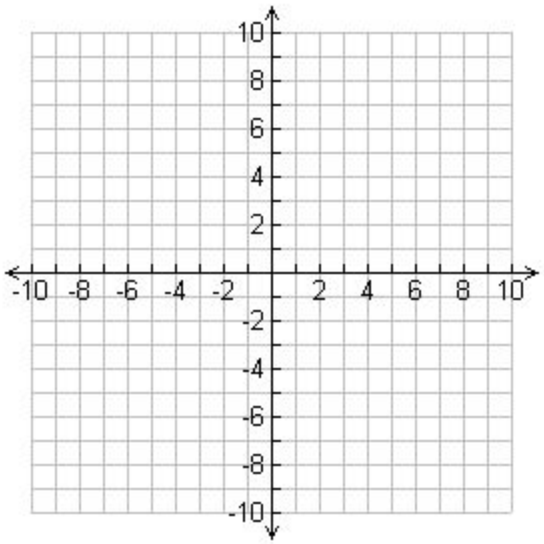
Explain transformation:

b. $f_2(x) = \log(x - 2)$



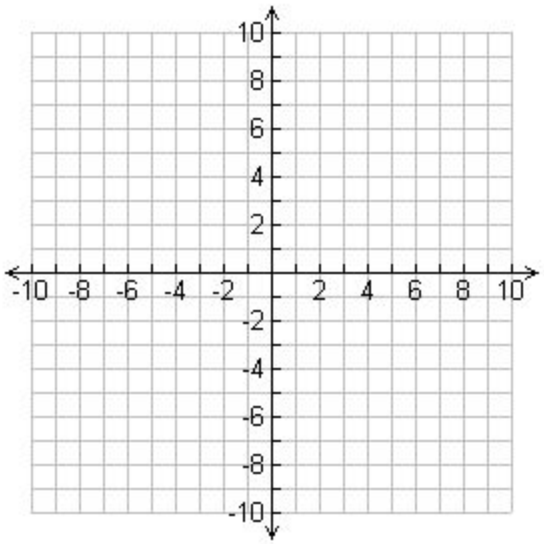
Explain transformation:

c. $f_3(x) = 4\log(x + 3) - 2$



Explain transformation:

d. $f_4(x) = \log_2(x) + 3$



Explain transformation: