Assignment 4B: Graphing Logarithmic Functions

Answer the following problems with as much details, explanations, and work that is appropriate.

1. Rewrite each equation in exponential form, then evaluate the logarithm.

   a. $x = \log_4 64$ b. $x = \log_2 32$ c. $x = \log 100000$

For each function (a) find the domain, (b) the equation of the vertical asymptote, (c) and describe the transformation of $f(x) = \log(x)$.
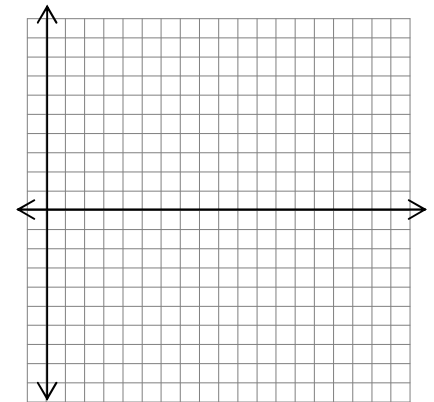
2. $f(x) = \log(x+2)$

3. $f(x) = \log(3x+1)$

4. $f(x) = 2\log(-x) + 1$
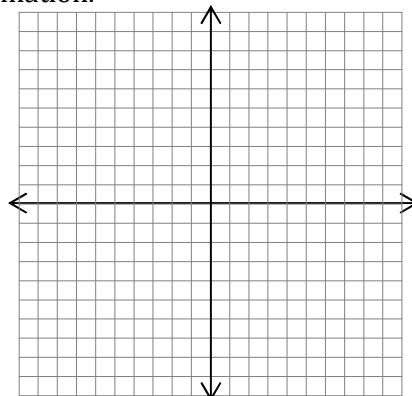
5. Sketch a graph of each pair of function.

   $f(x) = \log_2(x), \; g(x) = \log_4(x)$

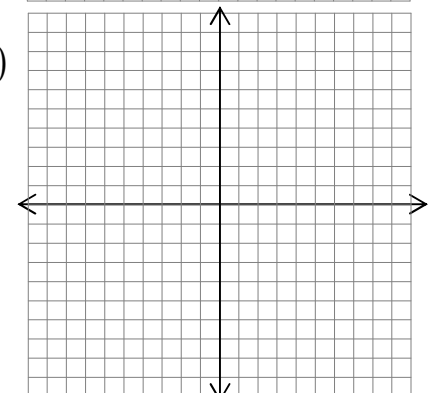   *Describe the similarities & differences in these graphs.*

Sketch each transformation.

6. $f(x) = -\log_2(x)$

7. $f(x) = \log_3(x+4)$

8. Find a formula in the form $f(x) = a\log_b(x + c)$ for the transformed logarithm graph shown.