Properties of Logarithmic Functions

In these exercises, we will see work with the domain and range of logarithmic functions. And we will use graph transformations to sketch graphs.

1. Find the domain and range of each of the following functions.

   a) f, where $f(x) = \ln(x-4)$

   b) g, where $g(x) = \log_2(2x+14)$

   c) b, where $b(x) = \ln(10-x)$

   d) c, where $c(x) = \log_7(14-2x)$

   e) p, where $f(x) = \ln(x-4) + \ln(10-x)$

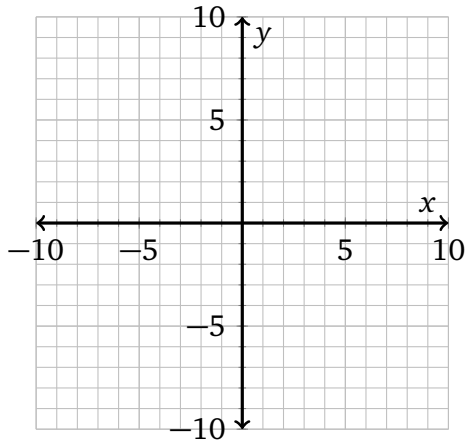
   f) q, where $q(x) = \frac{\log(x-6)}{\log(x+1)}$

   g) h, where $h(x) = \log\left(\left|\frac{x+1}{x-6}\right|\right)$

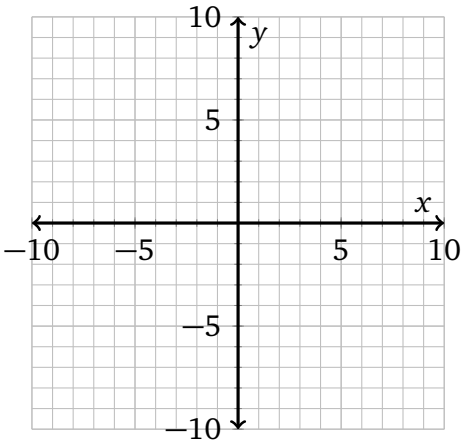
   h) k, where $k(x) = \log\left(\frac{x-6}{x+1}\right)$

2. Sketch a graph for each of the following functions without using a graphing calculator. It very much helps to remember that $\log_b(\ \ )$ is the inverse function of $b^{(\ \ )}$.

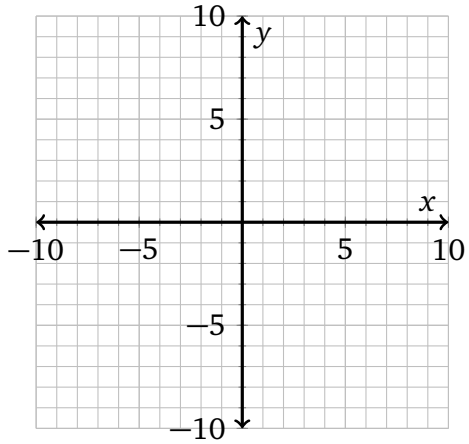
a) f, where $f(x) = \log_4(x)$



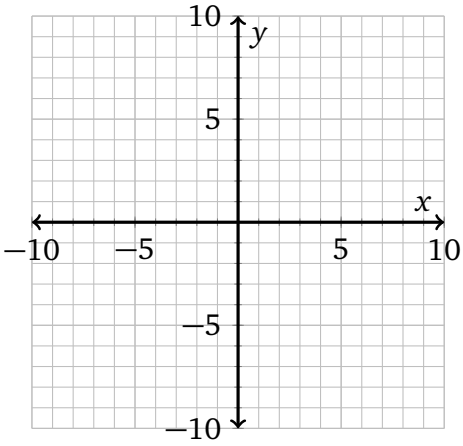
b) g, where $g(x) = \log_2(x+5)$



c) h, where $h(x) = -\log(x)$



d) h, where $h(x) = 5\log(-x)$



3. Find a formula for the function plotted. Hints: what basic function shape does this graph resemble? Can you identify some specific grid points that it passes through?