Problem 2.2 (from Duda, pg 65)

Suppose two equally probable one-dimensional densities are of the form $p(x \mid \omega_i) \propto \exp\{-|x - a_i|/b_i\}$ for $i = 1, 2$ and $b_i > 0$.

(a) Write an analytic expression for each density, that is, normalize each function for arbitrary a_i and positive b_i.

(b) Calculate the likelihood ratio as a function of your four variables.

(c) Sketch a graph of the likelihood ratio $p(x \mid \omega_1)/p(x \mid \omega_2)$ for the case $a_1 = 0$, $b_1 = 1$, $a_2 = 1$ and $b_2 = 2$.