Problems from Assignment 16

1. Suppose $X_1, X_2, \ldots, X_{31} \overset{\text{iid}}{\sim} \text{N}(\mu_X, \sigma_X^2)$ and $Y_1, Y_2, \ldots, Y_{41} \overset{\text{iid}}{\sim} \text{N}(\mu_Y, \sigma_Y^2)$. Also suppose you wish to test $H_0 : \sigma_X = \sigma_Y$ vs $H_1 : \sigma_X > \sigma_Y$.
   (a) What is the test statistic you would use?
   (b) Find the rejection region for this statistic at $\alpha = 0.1$ level.
   (c) What is the power of this test versus the fixed alternative $\sigma_X = (1.556)\sigma_Y$.