

Problems from Assignment 15

1. Suppose $X_1, X_2, \dots, X_{31} \stackrel{\text{iid}}{\sim} N(\mu_X, \sigma_X^2)$ and $Y_1, Y_2, \dots, Y_{41} \stackrel{\text{iid}}{\sim} N(\mu_Y, \sigma_Y^2)$. 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 $\sigma_X = (1.556)\sigma_Y$.