Exercise 4.7; Problem 5

(a).

Because QDA is more flexible than LDA, we can expect that QDA to perform better than LDA on the training set. But since the Bayes decision boundary is linear, QDA may cause the problem of overfit, LDA may perform better on the test set.

(b).

Because the Bayes decision boundary is non-linear, we can assume that QDA to perform better than LDA both on the training set and the test set. As QDA are more flexible, it can better fit the boundary. But the linear model cannot measure the boundary well.

(c).

From the previous class we can know that as n increases, the variance will reduce. So if the sample size n increases, the variance of QDA will reduce and the bias will stay lower than LDA, so it will perform better.

(d).

False. QDA are very likely to have overfitting problems. In contrast, LDA will have less bias than QDA.