Exam 2

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**Q1 (a)**

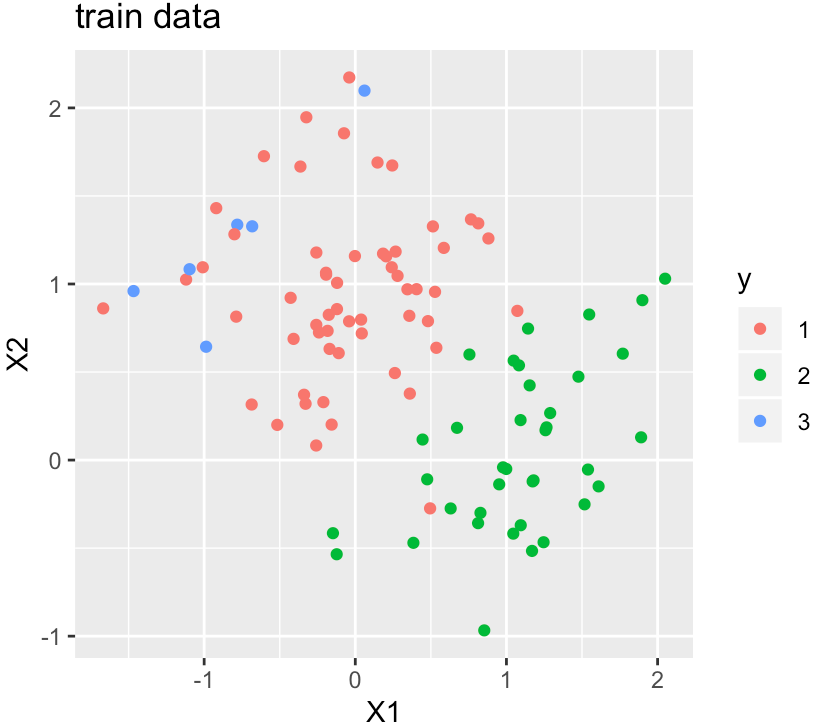
By the Bayes’ rule,

**(b)** Since the denominator and do not depend on i, we can write them as a constant

Take the log of both sides, we have

Thus,

**(c)**



**(e)** Estimate sample mean and sample covariance for each class given the training data

where .

Thus, we have

The desicion boundary of QDA is given by .

**(f)**Scatter plot of the training data with labels

QDA: When n increased from 100 to 1000, the number of data points with predicted labels of 3 and 2 increased while the number of data points with predicted labels of 1 decreased.