4. (6 pts) Briefly describe an experimental situation where a Bayes Regression with 1 predictor is likely to perform better than an OLS Regression with 1 predictor.

5. (6 pts) A researcher has predictor variables X1 though X40 to include in a regression model. In addition to Model Selection, the researcher is also exploring the possibility to use Principal Component Regression (PCR).

a) State one advantage for using the Model Selection approach.

b) State one advantage for using the PCR approach.

6. (10 pts) **Power and Sample Size Questions**

a) The probability of incorrectly rejecting the null hypothesis is called _____.

b) The probability of correctly rejecting the null hypothesis is called _____.

c) Briefly describe the impact to the Effect Size in a study with two treatments if the sample sizes for each treatment is increased.

d) Briefly describe the impact to Power in a study with two treatments if the sample sizes for each treatment is increased.

e) Briefly describe the impact to the Effect Size in a study with two treatments if the variance in the sampled population is decreased. (You can assume a common variance for the study.)

7. (8 pts) a) Briefly describe an experimental situation where Ridge regression is preferred over LASSO regression.

b) Briefly describe an experimental situation where LASSO regression is preferred over Ridge regression.

8. (5 pts) Select the statement below that is most true when Ridge regression is compared to OLS regression.

a) Ridge has larger bias, larger variance. **b)** Ridge has larger bias, smaller variance.

c) Ridge has smaller bias, larger variance. **d)** Ridge has smaller bias, smaller variance.