ANOVA Practice Problems

1. Suppose that a random sample of $n = 5$ was selected from the vineyard properties for sale in Sonoma County, California, in each of three years. The following data are consistent with summary information on price per acre for disease-resistant grape vineyards in Sonoma County. Carry out an ANOVA to determine whether there is evidence to support the claim that the mean price per acre for vineyard land in Sonoma County was not the same for each of the three years considered. Test at the 0.05 level and at the 0.01 level.

1996:	30000	34000	36000	38000	40000
1997:	30000	35000	37000	38000	40000
1998:	40000	41000	43000	44000	50000

2. The following data on calcium content of wheat are consistent with summary quantities that appeared in the article "Mineral Contents of Cereal Grains as Affected by Storage and Insect Infestation" (*Journal of Stored Products Research* [1992]). Four different storage times were considered. Is there sufficient evidence to conclude that the mean calcium content is not the same for the four different storage times? Test the appropriate hypotheses at the 0.05 level.

Storage Time	Observations					
0 months	58.75	57.94	58.91	56.85	55.21	57.30
1 month	58.87	56.43	56.51	57.67	59.75	58.48
2 months	59.13	60.38	58.01	59.95	59.51	60.34
3 months	62.32	58.76	60.03	59.36	59.61	61.95

3. Use the data below, showing a summary of highway gas mileage for several observations, to decide if the average highway gas mileage is the same for midsize cars, SUV's, and pickup trucks. Test the appropriate hypotheses at the $\alpha = 0.01$ level.

	n	Mean	Std. Dev.
Midsize	31	25.8	2.56
SUV's	31	22.68	3.67
Pickups	14	21.29	2.76