4) The dataset “Cocaine” contains 56 observations on the variables related

to sales of cocaine powder in northeastern California over the

period 1984-1991. The data are a subset of those

used in the study Caulkins, J. P. and R. Padman (1993),

"Quantity Discount and Quality Premia for Illicit Drugs,"

Journal of the American Statistical Association, 88, 748-757.

The variables are

price = price per gram in dollars for a cocaine sale,

quant = number of grams of cocaine in a given sale,

qual = quality of the cocaine expressed as percentage purity,

trend = a time variable with 1984 = 1 up to 1991 = 8.

Consider the regression model

price = beta1 + beta2 quant + beta3 qual + beta4 trend + e

a) What signs (positive or negative) would you expect for the

estimates of beta2 , beta3? (3 pts)

b) Use SAS to find the equation. Report the results and interpret

the coefficients. Have the signs turned as you expected ? (6 pts)

c) What proportion of variation in cocaine price is explained by

variation in quantity, quality, and time? (3 pts)

d) It is claimed that the greater the number of sales, the higher the

risk of getting caught; and thus sellers are willing to accept a lower

price if they can make sales in large quantities. Set up H0and Ha

that would be appropriate to test this hypothesis. Carry out the

hypothesis test. (5 pts)

e) Test the hypothesis that the quality of cocaine has no influence on

price. (5 pts)

f) What is the average annual change in the cocaine price? Can you

suggest why price might be changing in this direction? (5 pts)