1. A random sample of eight drivers insured with a company and having similar auto insurance policies was selected. The following table lists their driving experiences (in years) and monthly auto insurance premiums

Driving Experience (years)	Monthly Auto Insurance Premium
5	$64
2	87
12	50
9	71
15	44
6	56
25	42
16	60

   a. Define dependent and independent variables
   b. Compute S_{xx}, S_{yy}, and S_{xy}.
   c. Find the least squares regression line
   d. Using the regression line, find the error at x = 15.
   e. Compute the unbiased estimator for the standard deviation of the independent variable.
   f. Construct a 90% confidence interval for B_1
   g. Test at the 5% significance level whether B_0 is negative.

2. A researcher is studying the relationship between Hydrocarbon level (X) and Purity (Y) using ANOVA. He summarized his gathered results in the following ANOVA table. Complete the table and make conclusion at 5% significance level.

	Sum Square	DOF	Mean Square	
Regression				
Error	21.25		1.18	
Total	173.38			

3. Regression methods were used to analyze the data from a study investigating the relationship between roadway surface temperature (x) and pavement deflection (y). Summary quantities were n = 20, $\sum y_i = 12.75$, $\sum {y_i}^2 = 8.86$, $\sum x_i = 1478$, $\sum {x_i}^2 = 143{,}215.8$, and $\sum y_i\, x_i = 1083.67$.

   a. Calculate the least squares estimates of the slope and intercept.
   b. Use the equation of the fitted line to predict what pavement deflection would be observed when the surface temperature is 85.

4. The following graph presents data on y = chloride concentration in surface streams and x = roadway area.

y	4.4	6.6	9.7	10.6	10.8	10.9
x	0.19	0.15	0.57	0.70	0.67	0.63
y	11.8	12.1	14.3	14.7	15.0	17.3
x	0.47	0.70	0.60	0.78	0.81	0.78
y	19.2	23.1	27.4	27.7	31.8	39.5
x	0.69	1.30	1.05	1.06	1.74	1.62

a. Test the hypothesis H_0: $\beta_1 = 0$ versus H_1: $\beta_1 \neq 0$ using the analysis of variance procedure with $\alpha = 0.01$.
b. Find the P-value for the test in part (a).
c. Estimate the standard errors of b_1 and b_0.
d. Test the hypothesis H_0: $\beta_0 = 0$ versus H_1: $\beta_0 \neq 0$ using $\alpha = 0.01$. What conclusions can you draw? Does it seem that the model might be a better fit to the data if the intercept were removed?