AP STATISTICS
Unit 4: Linear Regression Worksheet – **Complete all work on separate paper**

0. Complete the following from your text: pg 189 #3, 4, 23, 27, 41, 48

For the exercises below, complete the following:

a) sketch a scatterplot – be sure to label your axes!
b) find the correlation coefficient, and interpret this value in context
c) find least squares regression equation – define any variables used or write the equation in context
d) sketch the residual plot – label your axes appropriately!
e) find the coefficient of determination, and interpret this value in context
f) make the prediction using the value under the data set.

1. The number of drinks consumed and the corresponding blood alcohol concentrations are listed for various subjects with the same body weight.

Number of drinks	2	2	4	5	8
BAC	0.05	0.06	0.11	0.13	0.22

f) Predict the blood alcohol level for a person of the same weight who has consumed 6 drinks.

2. A farmer notices that crickets seem to chirp faster on warm days. The accompanying table lists the number of chirps made by crickets in one minute, along with the corresponding temperature in degrees Fahrenheit.

Temperature	55	53	62	70	59	69	69	55	52	51
Chirps per minute	66	58	94	120	83	119	121	65	55	50

f) predict the chirps per minute for a temperature of 68 degrees.

3. The following table provides information on life expectancies for a sample of 22 countries. It also lists the number of people per television set in each country.

country	**per TV**	**life exp**	**country**	**per TV**	**life exp**
Angola	200	44	Mexico	6.6	72
Australia	2	76.5	Morocco	21	64.5
Cambodia	177	49.5	Pakistan	73	56.5
Canada	1.7	76.5	Russia	3.2	69
China	8	70	South Africa	11	64
Egypt	15	60.5	Sri Lanka	28	71.5
France	2.6	78	Uganda	191	51
Haiti	234	53.5	United Kingdom	3	76
Iraq	18	67	United States	1.3	75.5
Japan	1.8	79	Vietnam	29	65
Madagascar	92	52.5	Yemen	38	50

f) Predict the life expectance in a country with 100 people per television set.

g) Which of the countries listed has the fewest people per television set? the most?

h) Since the association is so strongly negative, one might conclude that simply sending television sets to the countries with lower life expectancies would cause their inhabitants to live longer. Comment on this argument.

i) If two variables have a correlation close to +1 or –1, indicating a strong linear association between them, does it follow that there must be a cause-and-effect relationship between them? Why or why not?

j) In the case of life expectancy and television sets, suggest a confounding variable that is associated with a country's life expectancy and with the prevalence of televisions in the country.