Correlation and Regression 2 Problems

1. A researcher is interested in the relation between drinking and depression. She classifies her participants as either depressed or not depressed and also as drinkers or nondrinkers. Conduct a phi coefficient for the following data and determine if the two variables are significantly related using alpha = .05. Use the conversion formula to tell us what the chi-square value would be.

	nondrinkers	drinkers
not depressed	10	6
depressed	5	8

2. A trainer wishes to determine if the number of miles a runner trains each week is related to their final time in the marathon. Use the data below to determine if there is relation between final time and miles trained per week. What level of power were you operating with? If someone trained 100 miles per week, what marathon time would you expect they would get?

miles trained	week final time (in hours)
26.00	4.26
35.00	4.90
55.00	3.80
75.00	3.40
60.00	3.30
18.00	5.10
45.00	3.60
50.00	3.40

3. Below is data concerning the number of years individuals have spent in school (beginning from grade 1) and their annual income (rounded to the nearest thousand dollars). Determine the following:
(a) What is the relation between years in school and income? Is this relation significant at alpha = .05?
(b) What was the level of power for this test in 1 (a)?
(c) What income would you predict for someone who spent 17 years in school?
(d) Compute the coefficient of determination and perform an F test to determine if years in school accounts for a significant proportion of variation in income using alpha = .05.
(e) Test the significance of the regression coefficient.
(f) Compute the standard error of estimate.

Here is the data:

Years	income (in 000's)
12	23
14	34
10	28
16	39
18	55
21	65
20	80
18	72
11	19
14	28
16	44
16	48