Math 263, Section 5 **Name**_____

First Test Spring 2014 **Pin (4 figure number, *not* starting with 0)**_____

30 minutes; total 50 points. There are 5 problems.

1. (**5 points**) To determine the health care costs of its employees, a company interviewed a sample of 25 employees.[1] Their medical expenses for the previous year were recorded. The highest expense was accidentally recorded as 10 times its actual value. However, after correcting the error, the corrected amount was still greater or equal to any other expense in the sample. Which of the following must have remained the same after the correction was made?
(*Check those that must have remained the same; put a line through the others*):

___Mean
___Median
___IQR
___Range
___Standard deviation

2. (**6 points**) Ana's standardized score (z-score) for her systolic blood pressure, as compared to the blood pressure for other women her age, is 1.50. Which of the following is a correct interpretation of the z-score?
(*Check those that are correct; put a line through the others*).

___ Ana's systolic blood pressure is 150.
___Ana's systolic blood pressure is 1.5 above the mean systolic blood pressure of women her age.
___Ana's systolic blood pressure is 1.5 times the mean systolic blood pressure of women her age.
___Ana's systolic blood pressure is 1.5 standard deviations above the mean systolic blood pressure of women her age.
___Only 1.5% of the women of Ana's age have systolic blood pressure higher than hers.
___50% of the women of Ana's age have systolic blood pressure higher than hers.

[1] Problems based on CB, 1997

3. (**8 points**) The Federal Highway Administration collects data on the number of vehicles in various countries.[2] The following table shows the data for one year in the US and Mexico, in millions of vehicles.

	US	Mexico
Cars	130	9
Other vehicles	80	5

(a) How many vehicles are there in the two countries combined? (*Give your answer in millions*.)

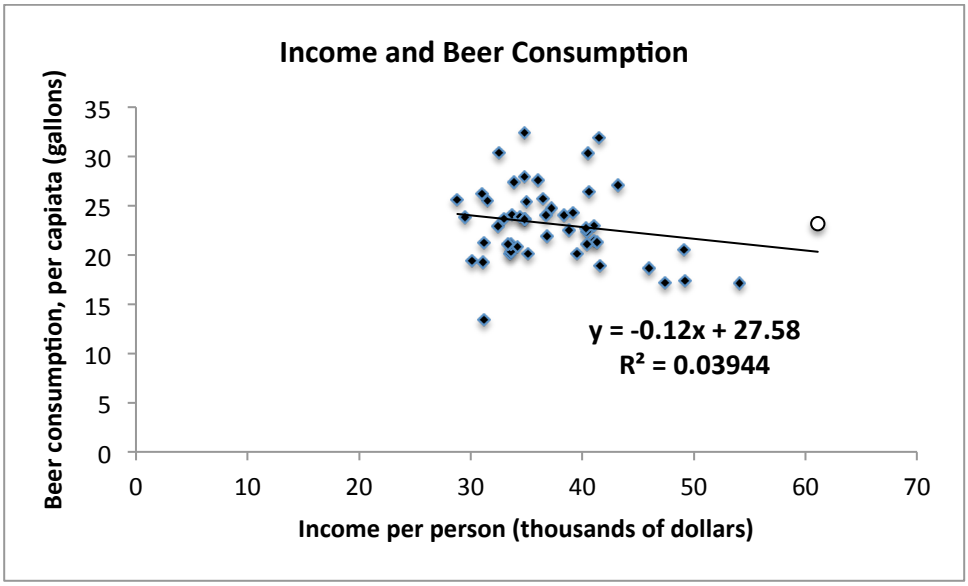
(b) Create the conditional distribution for each country by filling in the six cells outlined in black. Give your answers with 3 digits after the decimal point.

	US	Mexico
Cars		
Other vehicles		

(c) Is there an association between country and vehicle distribution? Yes ____ No ____ (check one)
Reason for your answer:

[2] From *Highway Statistics*, reported by Weiss in *Introductory Statistics*, 9th edn (Addison Wesley, 2012).

4. (**12 points**) Do people with higher incomes spend more on beer? The scatter plot shows annual beer consumption (in gallons) plotted against personal income (in thousands of dollars per year) for the each of the US states and DC. A regression line has been fitted to the data.



(a) What is the correlation coefficient? (*Give three decimal places*.)

(b) What is the slope of the line?

(c) Interpret the slope in terms of beer. Give units.

(d) What is the intercept of the line?

(e) Interpret the intercept in terms of beer. Give units.

(f) If the point representing DC (marked by a hollow circle) were removed and a new regression line were drawn, would the slope of the new regression line be (*check one*):

Smaller (more negative) than the original slope ____
Larger (less negative) than the original slope ____
Same as the original slope ____

(g) On the graph, circle and label the state (Utah) whose beer consumption is most substantially less than that predicted by the line.

(h) What percent of the variation about the mean beer consumption is predicted by per capita income?

5. (**19 points**) In Area A of Tucson, house prices are normally distributed, with mean $350 thousand, median $350 thousand, and standard deviation $72 thousand.

(a) Find the proportion of houses in Area A that are worth more than half a million dollars. (*Show work.*)

(b) Find the proportion of houses in Area A that are worth between a quarter and half a million dollars. (*Show work.*)

(c) Find the house price at the bottom of the top tenth percentile in Area A. (*Show work.*)

(d) In Area B of Tucson, house prices have a mean of $280 thousand, a median of $250 thousand and a standard deviation of $175 thousand. Mark the following statements as **T**(true) or **F** (false):

___ There is a smaller proportion of houses with prices below $280 thousand in the Area B than in Area A.

Brief reason:

___ The proportion of houses in the Area A with prices below $350 thousand is the same as the proportion of houses in Area B with prices below $250.

Brief reason:

___ Prices are more consistent (less variable) in Area B than in Area A.

Brief reason:

___ Prices in Area B are skewed right.

Brief reason:

___ Prices in Area B could be normally distributed.

Brief reason: