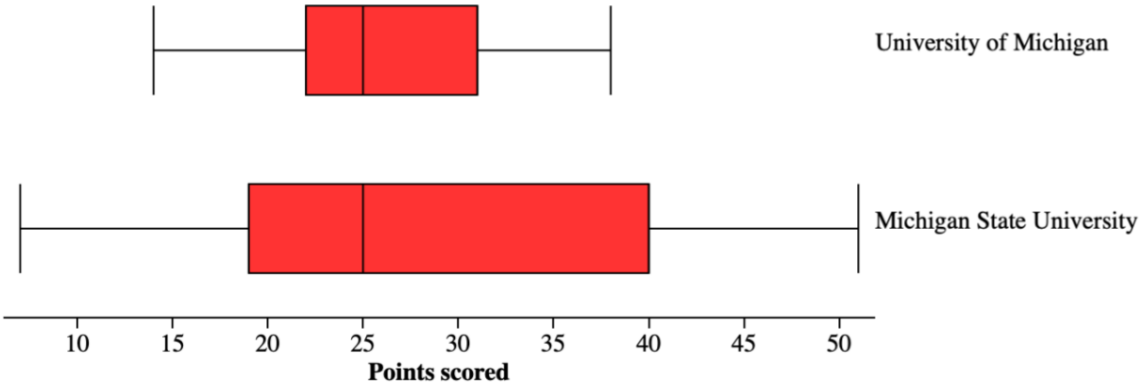
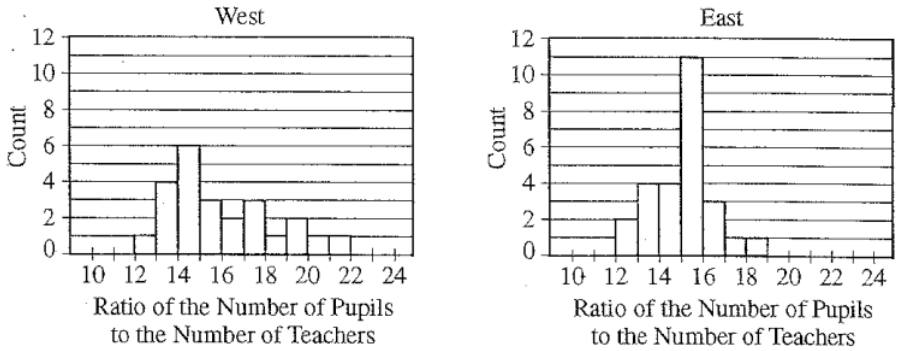
Mr. Wilcox is a huge fan of University of Michigan football. His favorite season was the 1997 season (a perfect season!). Here is a back-to-back stemplot of the points scored by the 1997 University of Michigan football team and the archrival Michigan State University football team. Write a few sentences comparing the distributions.



Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

1. Records are kept by each state in the United States on the number of pupils enrolled in public schools and the number of teachers employed by public schools for each school year. From these records, the ratio of the number of pupils to the number of teachers (P-T ratio) can be calculated for each state. The histograms below show the P-T ratio for every state during the 2001–2002 school year. The histogram on the left displays the ratios for the 24 states that are west of the Mississippi River, and the histogram on the right displays the ratios for the 26 states that are east of the Mississippi River.



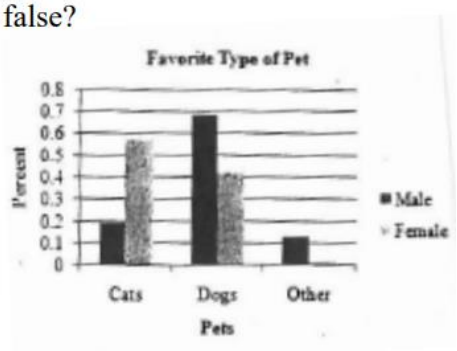
(b) Write a few sentences comparing the distributions of P-T ratios for states in the two groups (west and east) during the 2001–2002 school year.

1. Which of the following is NOT a quantitative variable?
   a. Number of dogs in a house
   b. A TV channel number
   c. A student's shoe size
   d. Number of songs played on a radio station in one hour
   e. Number of songs stored on a person's iPod

7. Which of the following are false statements about stem and leaf plots?
   I. They are used to display both categorical and quantitative variables.
   II. They are useful for both small and large datasets.
   III. One can easily see the shape of the distribution and unusual data values.

   a. I only b. III only c. I and III d. I and II e. II and III

11. Given the following comparative bar chart, which of the following is false?

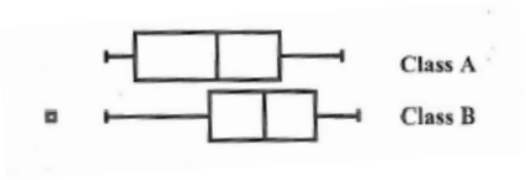


a. More females prefer cats than dogs
b. A higher percentage of doge lovers are male
c. A very small percentage of women prefer a pet other than cats or dogs
d. About 20% of the people who prefer cats are male.
e. Almost half of the the dog lovers are female.

13. The most appropriate graph to display data on the distribution of favorite foods for the students in your statistics class is

a. a bar chart
b. a scatterplot
c. a back to back stem and leaf plot
d. a histogram
e. a cumulative frequency plot

14. Each of the boxplots shown contains 24 student scores on a recent test in two different classes. Which answer best describes these displays?



a. Class A had more people in the 2nd quartile than Class B.
b. Class A and Class B both have the same number of people passing the test.
c. Class A is somewhat symmetric, while Class B is skewed right with a noticeable outlier as well.
d. Class B is skewed left and had a noticeable outlier as well, while Class A is somewhat skewed right.
e. The lower 25% of class B are much more spread out than the lower 25% of Class A making Class B a skewed left distribution.

21. Below are the travel times in minutes for 15 workers in North Carolina chosen at random by the Census Bureau.

30	20	10	40	25	20	10	60
15	40	5	30	12	10	10	

a. Compute the mean and median _____ b. Compute the range and IQR _____

c. Compute the limits for outliers _____ d. Compute the standard deviation _____

e. Name the 5-number summary and draw a box-plot of this data

23. Two AP teachers within a school district have recorded their test results on the district exam that was taken at the end of the first semester of the course. All students had been taught the same chapters prior to the first semester exam. The results are shown below.

Teacher A	59, 86, 92, 42, 71, 73, 78, 80, 75, 84, 73, 78
Teacher B	67, 68, 70, 55, 60, 95, 86, 72, 85, 80, 74, 59

a. Draw comparative boxplots for both teachers.

b. Were outliers detected? Explain how you arrived at this answer.

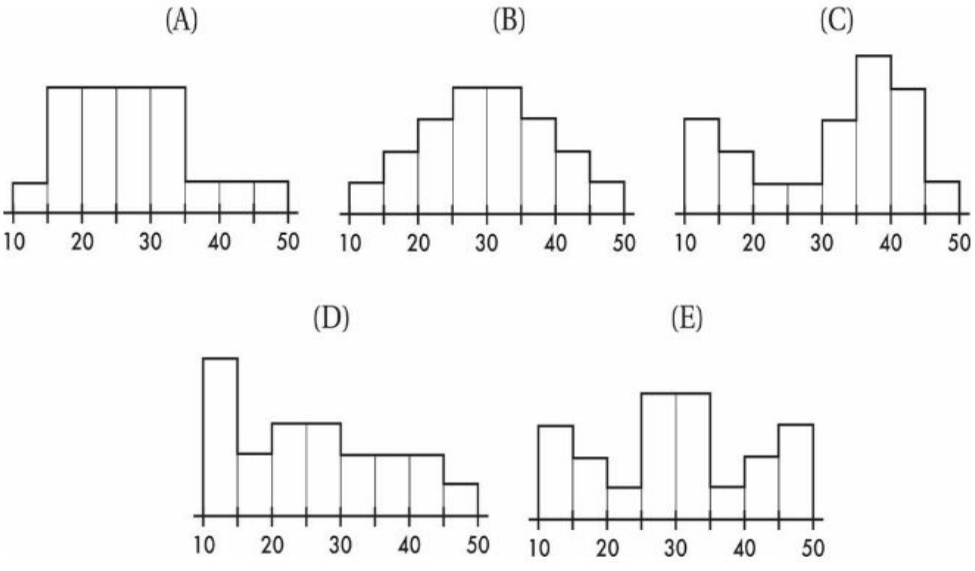
24. A small college offers On Campus housing and Off Campus housing. An unmotivated worker in the housing office was goofing around on her phone at work and forgot to complete the chart.

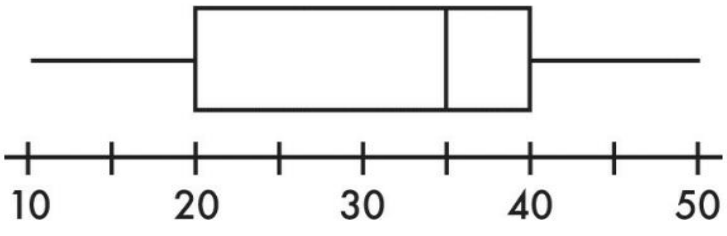
How many Upper Classmen live in On Campus housing?

A. 106
B. 216
C. 274
D. 312
E. 386

	Freshmen	Upper Classmen	Total
Off Campus	_	280	352
On Campus	84	_	190
Total	156	_	542

25. To which of the below five histograms does the following boxplot correspond?





26.

Which of the following statements about the correlation coefficient is true?

1. The correlation coefficient and the slope of the regression line may have opposite signs.
2. A correlation of 1 indicates a perfect cause-and-effect relationship between the variables.
3. Correlations of +0.87 and −0.87 indicate the same degree of clustering around the regression line.
4. Correlation applies equally well to quantitative and categorical data.
5. A correlation of 0 shows little or no association between two variables.

27.

The random variable X is normally distributed with a mean of 10 and a standard deviation of 1.5.

Approximately 84% of the observations of this data set are greater than

A 8.50

B 10.50

C 7.50

D 11.50

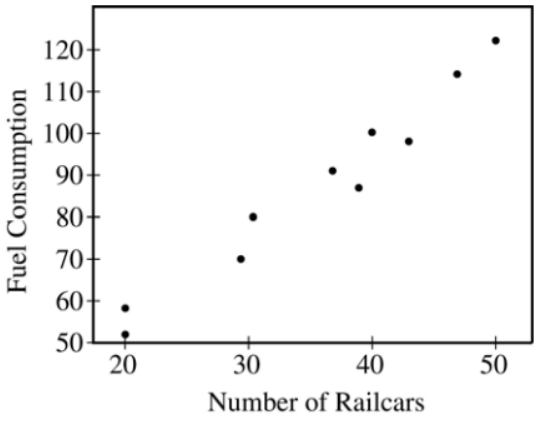
E 8.04

28.

The Great Plains Railroad is interested in studying how fuel consumption is related to the number of railcars for its trains on a certain route between Oklahoma City and Omaha.

A random sample of 10 trains on this route has yielded the data in the table below.

Number of Railcars	Fuel Consumption (units/mile)
20	58
20	52
37	91
31	80
47	114
43	98
39	87
50	122
40	100
29	70



Write a few sentences describing the scatterplot.