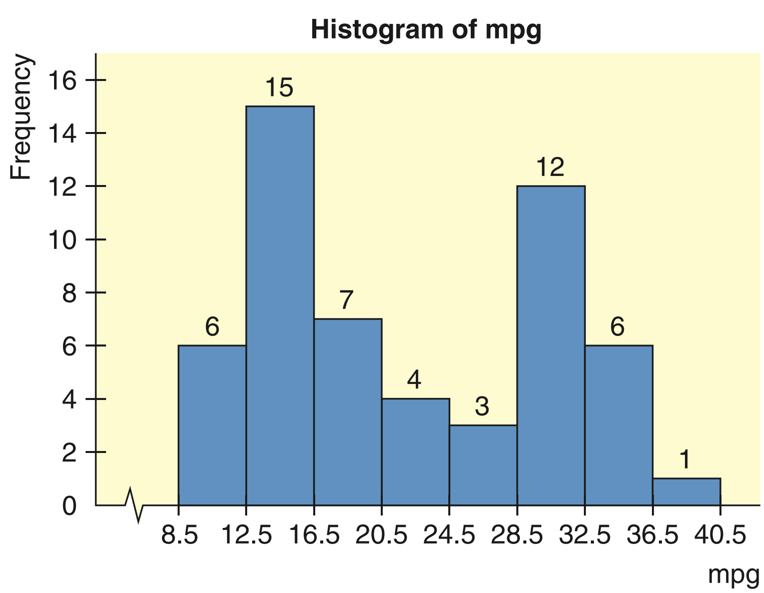
Statistics Optional Take-Home Test 1

Number of questions—5

Directions: Solve each of the following problems using separate paper, while clearly indicating each problem number when solving. Irrelevant work will detract from your score, while answers without work shown will be awarded no credit. Answers with partially correct work will receive partial credit. Each problem is worth 20 points. You must work alone, but you may use a graphing calculator as a supplement to your own work if you indicate the steps used. You may not use a phone, computer, computational intelligence, AI, or other tools to assist you in solving the problems.

1. Write the sample type that best fits each description. Choose from simple random, stratified, cluster, systematic, and convenience.
   (a) A company divided their employees by their states and then selected three employees from each state.
   (b) A reporter asked everyone entering a grocery store a question.
   (c) A potato chip manufacturer randomly selected ten boxes of bags of chips on their assembly line to have every bag of chips in the selected boxes checked for consistency.
   (d) A gardener numbered all plants in his garden and then selected every fifth plant after starting from a random number.
   (e) A raffle organizer rolled shuffled paper tickets in a hat and then drew 6 tickets without looking.
2. Look at the histogram in the figure, which shows mileage, in miles per gallon (mpg), for a random selection of older passenger cars.



(a) What distribution shape best describes this histogram?

(b) How many cars get 21-24 mpg?

(c) How many cars were selected in total?

(d) What percentage of cars get 16 mpg or less?

3. Wetlands offer a diversity of benefits. They provide a habitat for wildlife, spawning grounds for U.S. commercial fish, and renewable timber resources. In the last 200 year, the Unites States has lost more than half its wetlands. *Environmental Almanac* gives the percentage of wetlands lost in each state in the last 200 years. For the lower 48 states, the percentage loss of wetlands per state is as follows:

46	37	36	42	81	20	73	59	35	50
87	52	24	27	38	56	39	74	56	31
27	91	46	9	54	52	30	33	28	35
35	23	90	72	85	42	59	50	49	
48	38	60	46	87	50	89	49	67	

(a) Make a stem-and-leaf display with the data. Be sure to indicate the scale.

(b) What distribution shape best fits the data? Explain your answer.

4. Given the sample data

23 17 15 30 25

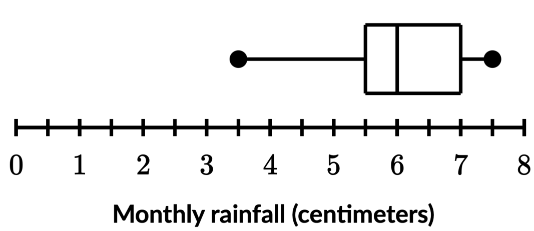
(a) Find the mean of the data.

(b) Find the variance of the data.

(c) Find the standard deviation of the data.

(d) Find an interval in which at least 88.9% of the data fall.

5. Here is a box plot that summarizes the average monthly rainfall of several cities.



(a) Find the range of the data.

(b) Find the interquartile range of the data.

(c) Find the median of the data.

(d) What percent of cities have more than 5.5 cm of rainfall?