

Test Bank for Business Statistics in Practice 8th Edition by Bowerman  
O'Connell Murphree ISBN 9781259549465 1259549461

Full link download:

Test bank:

<https://testbankpack.com/p/test-bank-for-business-statistics-in-practice-8th-edition-by-bowerman-oconnell-murphree-isbn-9781259549465-1259549461/>

Solution Manual:

<https://testbankpack.com/p/solution-manual-for-business-statistics-in-practice-8th-edition-by-bowerman-oconnell-murphree-isbn-9781259549465-1259549461/>

**Chapter 02 Test Bank - Static KEY**

1. A stem-and-leaf display is a graphical portrayal of a data set that shows the data set's overall pattern of variation.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.  
Topic: Stem-and-Leaf Displays*

2. The relative frequency is the frequency of a class divided by the total number of measurements.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Qualitative Data*

3. A bar chart is a graphic that can be used to depict qualitative data.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 1 Easy  
Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.  
Topic: Graphically Summarizing Qualitative Data*

4. Stem-and-leaf displays and dot plots are useful for detecting outliers.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-04 Construct and interpret dot plots.  
Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.  
Topic: Dot Plots  
Topic: Stem-and-Leaf Displays*

5. A scatter plot can be used to identify outliers.

**FALSE**

A scatter plot is used to identify the relationship between two variables.

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-07 Examine the relationships between variables by using scatter plots.  
Topic: Scatter Plots*

6. When looking at the shape of the distribution using a stem-and-leaf, a distribution is skewed to the right when the left tail is shorter than the right tail.

**TRUE**

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.  
Topic: Stem-and-Leaf Displays

7. When we wish to summarize the proportion (or fraction) of items in a class, we use the frequency distribution for each class.

**FALSE**

This is the definition for relative frequency. Frequency distribution shows actual counts of items in a class.

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Qualitative Data

8. When establishing the classes for a frequency table, it is generally agreed that the more classes you use the better your frequency table will be.

**FALSE**

Classes should be determined by the number of data measurements.

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 1 Easy  
Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Qualitative Data

9. The sample cumulative distribution function is nondecreasing.

**TRUE**

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

10. A frequency table includes row and column percentages.

**FALSE**

Frequency tables include frequencies, relative frequency, and percent frequency. Cross-tabulation tables include row and column percentages.

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.  
Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Qualitative Data  
Topic: Graphically Summarizing Quantitative Data

11. When constructing any graphical display that utilizes categorical data, classes that have frequencies of 5 percent or less are usually combined together into a single category.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-02 Construct and interpret Pareto charts.  
Topic: Graphically Summarizing Qualitative Data*

12. In a Pareto chart, the bar for the "Other" category should be placed to the far left of the chart.

**FALSE**

The bar to the far left of the Pareto chart will be the category with the highest frequency.

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 1 Easy  
Learning Objective: 02-02 Construct and interpret Pareto charts.  
Topic: Graphically Summarizing Qualitative Data*

13. In the first step of setting up a Pareto chart, a frequency table should be constructed of the defects (or categories) in decreasing order of frequency.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-02 Construct and interpret Pareto charts.  
Topic: Graphically Summarizing Qualitative Data*

14. It is possible to create different interpretations of the same graphical display by simply using different captions.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-08 Recognize misleading graphs and charts.  
Topic: Misleading Graphs and charts*

15. Beginning the vertical scale of a graph at a value different from zero can cause increases to look more dramatic.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-08 Recognize misleading graphs and charts.  
Topic: Misleading Graphs and charts*

16. A runs plot is a form of scatter plot.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 1 Easy  
Learning Objective: 02-07 Examine the relationships between variables by using scatter plots.  
Topic: Scatter Plots*

17. The stem-and-leaf display is advantageous because it allows us to actually see the measurements in the data set.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 1 Easy  
Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.  
Topic: Stem-and-Leaf Displays*

18. Splitting the stems refers to assigning the same stem to two or more rows of the stem-and-leaf display.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.  
Topic: Stem-and-Leaf Displays*

19. When data are qualitative, the bars should never be separated by gaps.

**FALSE**

Bar graphs for qualitative data are displayed with a gap between each category.

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.  
Topic: Graphically Summarizing Quantitative Data*

20. Each stem of a stem-and-leaf display should be a single digit.

**FALSE**

Leaves on the stem-and-leaf are a single digit.

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.  
Topic: Stem-and-Leaf Displays*

21. Leaves on a stem-and-leaf display should be rearranged so that they are in increasing order from left to right.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium  
Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.  
Topic: Stem-and-Leaf Displays*

22. Gauges feature a single measure showing variation over time.

**FALSE**

Sparklines feature a single measure showing variation over time.

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.  
Topic: Descriptive Analytics*

23. Data drill down is a form of data discovery.

**TRUE**

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 1 Easy*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.  
Topic: Descriptive Analytics*

24. Treemaps are used to display qualitative measures of performance.

**FALSE**

Treemaps help visualize two variables on quantitative measures.

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.  
Topic: Descriptive Analytics*

25. Sparklines always need to be displayed with either their axes or coordinates.

**FALSE**

Sparklines seldom show their axes or coordinates.

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.  
Topic: Descriptive Analytics*

26. A bullet graph features a single measure as either a horizontal or vertical bar.

**TRUE**

*AACSB: Reflective Thinking*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.*

*Topic: Descriptive Analytics*

27. Key performance indicators are best represented by a data discovery method.

**FALSE**

KPIs are best represented by an analytic dashboard.

*AACSB: Reflective Thinking*

*Blooms: Remember*

*Difficulty: 3 Hard*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.*

*Topic: Descriptive Analytics*

28. A treemap graphic is a series of clustered rectangles.

**TRUE**

*AACSB: Reflective Thinking*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.*

*Topic: Descriptive Analytics*

29. Sparklines are line charts often embedded with the text where they are being discussed.

**TRUE**

*AACSB: Reflective Thinking*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.*

*Topic: Descriptive Analytics*

30. An analytic dashboard presents both current and historical trends of a business's key performance indicators.

**TRUE**

*AACSB: Reflective Thinking*

*Blooms: Remember*

*Difficulty: 2 Medium*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.*

*Topic: Descriptive Analytics*

31. If space is an issue when presenting analytic dashboard graphics, gauges should be used most frequently.

**FALSE**

Gauges take up considerable space and are cluttered.

*AACSB: Reflective Thinking*

*Blooms: Remember*

*Difficulty: 3 Hard*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.*

*Topic: Descriptive Analytics*

32. Which of the following is not a graphical tool for descriptive analytics (dashboards)?

- A. bullet graph
- B. sparkline
- C. scatter plot**
- D. treemap
- E. gauge

*AACSB: Reflective Thinking*

*Blooms: Remember*

*Difficulty: 1 Easy*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.*

*Topic: Descriptive Analytics*

33. A(n) \_\_\_\_\_ is a graphical presentation of the current status and historical trends of a business's key performance indicators.

- A. frequency distribution
- B. histogram
- C. Pareto chart
- D. dashboard**

*AACSB: Reflective Thinking*

*Blooms: Remember*

*Difficulty: 2 Medium*



*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.  
Topic: Descriptive Analytics*

34. As a business owner, I have requested my staff to develop a set of dashboards that can be used by the public to show wait time at each of my four local coffee shops at peak times during the day and whether the time is short, medium, or long. Which of the following graphical displays would be the best choice?

- A. bullet graph
- B. sparkline
- C. treemap
- D. gauges

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 3 Hard*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.  
Topic: Descriptive Analytics*

35. Which of the following is the best analytic dashboard graphical method for visualizing hierarchical information?

- A. bullet graph
- B. sparkline
- C. treemap
- D. gauge

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.  
Topic: Descriptive Analytics*

36. Which of the following dashboard graphical methods will show variation over time?

- A. bullet graph
- B. sparkline
- C. treemap
- D. gauge

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.  
Topic: Descriptive Analytics*

37. A(n) \_\_\_\_\_ is a graph of a cumulative distribution.

- A. histogram
- B. scatter plot
- C. ogive plot
- D. pie chart

*AACSB: Reflective Thinking*

*Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

38. \_\_\_\_\_ can be used to study the relationship between two variables.

- A. Cross-tabulation tables
- B. Frequency tables
- C. Cumulative frequency distributions
- D. Dot plots

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 1 Easy*

*Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.  
Topic: Contingency Tables*

39. Row or column percentages can be found in

- A. frequency tables.
- B. relative frequency tables
- C. cross-tabulation tables.
- D. cumulative frequency tables.

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.  
Topic: Contingency Tables*

40. All of the following are used to describe quantitative data except the \_\_\_\_\_.

- A. histogram
- B. stem-and-leaf chart
- C. dot plot
- D. pie chart

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

*Topic: Graphically Summarizing Quantitative Data*

41. An observation separated from the rest of the data is a(n) \_\_\_\_\_.

- A. absolute extreme
- B. outlier
- C. mode
- D. quartile

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 1 Easy*

*Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.  
Topic: Stem-and-Leaf Displays*

42. Which of the following graphs is for qualitative data? A. histogram  
**B. bar chart**  
C. ogive plot  
D. stem-and-leaf

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.

Topic: Graphically Summarizing Qualitative Data

43. A plot of the values of two variables is a \_\_\_\_\_ plot.  
A. runs  
**B. scatter**  
C. dot  
D. ogive

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium

Learning Objective: 02-07 Examine the relationships between variables by using scatter plots.

Topic: Scatter Plots

44. A Stem-and-leaf display is best used to \_\_\_\_\_.  
A. provide a point estimate of the variability of the data set  
B. provide a point estimate of the central tendency of the data set  
**C. display the shape of the distribution**  
D. None of the other choices is correct.

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium

Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.

Topic: Stem-and-Leaf Displays

45. When grouping a large sample of measurements into classes, the \_\_\_\_\_ is a better tool than the \_\_\_\_\_.
- A. histogram, stem-and-leaf display**  
B. box plot, histogram  
C. stem-and-leaf display, scatter plot  
D. scatter plot, box plot

AACSB: Reflective Thinking  
Blooms: Understand  
Difficulty: 3 Hard

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

46. A \_\_\_\_\_ displays the frequency of each group with qualitative data and a \_\_\_\_\_ displays the frequency of each group with quantitative data.

- A. histogram, stem-and-leaf display
- B. bar chart, histogram**
- C. scatter plot, bar chart
- D. stem-and-leaf, pie chart

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.  
Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

*Topic: Graphically Summarizing Qualitative Data  
Topic: Graphically Summarizing Quantitative Data*

47. A \_\_\_\_\_ shows the relationship between two variables.

- A. stem-and-leaf
- B. bar chart
- C. histogram
- D. scatter plot**
- E. pie chart

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-07 Examine the relationships between variables by using scatter plots.*

*Topic: Scatter Plots*

48. A \_\_\_\_\_ can be used to differentiate the "vital few" causes of quality problems from the "trivial many" causes of quality problems.

- A. histogram
- B. scatter plot
- C. Pareto chart**
- D. ogive plot
- E. stem-and-leaf display

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-02 Construct and interpret Pareto charts.  
Topic: Graphically Summarizing Qualitative Data*

49. \_\_\_\_\_ and \_\_\_\_\_ are used to describe qualitative (categorical) data.

- A. Stem-and-leaf displays, scatter plots
- B. Scatter plots, histograms
- C. Box plots, bar charts
- D. Bar charts, pie charts**
- E. Pie charts, histograms

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.*

*Topic: Graphically Summarizing Qualitative Data*

50. Which one of the following graphical tools is used with quantitative data?

- A. bar chart
- B. histogram**
- C. pie chart
- D. Pareto chart

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

*Topic: Graphically Summarizing Quantitative Data*

51. When developing a frequency distribution, the class (group) intervals should be \_\_\_\_\_.

- A. large
- B. small
- C. integer
- D. mutually exclusive**
- E. equal

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 3 Hard*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

*Topic: Graphically Summarizing Quantitative Data*

52. Which of the following graphical tools is not used to study the shapes of distributions?

- A. stem-and-leaf display
- B. scatter plot**
- C. histogram
- D. dot plot

*AACSB: Reflective Thinking  
Blooms: Understand  
Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

53. All of the following are used to describe qualitative data except the \_\_\_\_\_.

- A. bar chart
- B. pie chart
- C. histogram**
- D. pareto chart

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.

Topic: Graphically Summarizing Qualitative Data

54. If there are 130 values in a data set, how many classes should be created for a frequency histogram?

- A. 4
- B. 5
- C. 6
- D. 7
- E. 8**

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

55. If there are 120 values in a data set, how many classes should be created for a frequency histogram?

- A. 4
- B. 5
- C. 6
- D. 7**
- E. 8

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

56. If there are 62 values in a data set, how many classes should be created for a frequency histogram?

- A. 4
- B. 5
- C. 6**
- D. 7
- E. 8

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

57. If there are 30 values in a data set, how many classes should be created for a frequency histogram?

- A. 4
- B. 5**
- C. 6
- D. 7
- E. 8

*AACSB: Analytical Thinking*

*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

*Topic: Graphically Summarizing Quantitative Data*

58. A CFO is looking at what percentage of a company's resources are spent on computing. He samples companies in the pharmaceutical industry and develops the following stem-and-leaf graph.

5	269
6	255568999
7	11224557789
8	001222458
9	02455679
10	1556
11	137
12	
13	255

What is the approximate shape of the distribution of the data?

- A. normal
- B. skewed to the right**
- C. skewed to the left
- D. bimodal
- E. uniform

*AACSB: Analytical Thinking*

*Blooms: Analyze*

*Difficulty: 2 Medium*

*Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.*

*Topic: Stem-and-Leaf Displays*

59. A CFO is looking at what percentage of a company's resources are spent on computing. He samples companies in the pharmaceutical industry and develops the following stem-and-leaf graph.

5	269
6	255568999
7	11224557789
8	001222458
9	02455679
10	1556
11	137
12	
13	255

What is the smallest percentage spent on R&D?

- A. 5.9
- B. 5.6
- C. 5.2**
- D. 5.02
- E. 50.2

*AACSB: Reflective Thinking*

*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.*

*Topic: Stem-and-Leaf Displays*

60. A CFO is looking at what percentage of a company's resources are spent on computing. He samples companies in the pharmaceutical industry and develops the following stem-and-leaf graph.

5	269
6	255568999
7	11224557789
8	001222458
9	02455679
10	1556
11	137
12	
13	255

If you were creating a frequency histogram using these data, how many classes would you create?

- A. 4
- B. 5
- C. 6**



- D. 7
- E. 8

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data

61. A CFO is looking at what percentage of a company's resources are spent on computing. He samples companies in the pharmaceutical industry and develops the following stem-and-leaf graph.

5	269
6	255568999
7	11224557789
8	001222458
9	02455679
10	1556
11	137
12	
13	255

What would be the class length used in creating a frequency histogram?

- A. 1.4
- B. 8.3
- C. 1.2
- D. 1.7
- E. 0.9

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data

62. A CFO is looking at what percentage of a company's resources are spent on computing. He samples companies in the pharmaceutical industry and develops the following stem-and-leaf graph.

5	269
6	255568999
7	11224557789
8	001222458
9	02455679
10	1556
11	137
12	
13	255

What would be the first class interval for the frequency histogram?

- A. 5.2-6.5
- B. 5.2-6.0
- C. 5.0-6.0

- D. 5.2-6.6
- E. 5.2-6.4

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data

63. A local airport keeps track of the percentage of flights arriving within 15 minutes of their scheduled arrivals. The stem-and-leaf plot of the data for one year is below.

76	9
77	114
78	
79	07
80	88
81	2
82	1
83	88

How many flights were used in this plot?

- A. 7
- B. 9
- C. 10
- D. 11
- E. 12**

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.  
Topic: Stem-and-Leaf Displays

64. A local airport keeps track of the percentage of flights arriving within 15 minutes of their scheduled arrivals. The stem-and-leaf plot of the data for one year is below.

76	9
77	114
78	
79	07
80	88
81	2
82	1
83	88

In developing a histogram of these data, how many classes would be used?

- A. 4**
- B. 5
- C. 6
- D. 7
- E. 8

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*  
*Topic: Graphically Summarizing Quantitative Data*

65. A local airport keeps track of the percentage of flights arriving within 15 minutes of their scheduled arrivals. The stem-and-leaf plot of the data for one year is below.

76	9
77	114
78	
79	07
80	88
81	2
82	1
83	88

What would be the class length for creating the frequency histogram?

- A. 1.4
- B. 0.8
- C. 2.7
- D. 1.7**
- E. 2.3

*AACSB: Analytical Thinking*  
*Blooms: Apply*  
*Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*  
*Topic: Graphically Summarizing Quantitative Data*

66. A company collected the ages from a random sample of its middle managers, with the resulting frequency distribution shown below.

<i>Class Interval</i>	<i>Frequency</i>
20 to < 25	8
25 to < 30	6
30 to < 35	5
35 to < 40	12
40 to < 45	15
45 to < 50	7

What would be the approximate shape of the relative frequency histogram?

- A. symmetrical
- B. uniform
- C. multiple peaks
- D. skewed to the left**
- E. skewed to the right

*AACSB: Reflective Thinking*  
*Blooms: Understand*  
*Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

67. A company collected the ages from a random sample of its middle managers, with the resulting frequency distribution shown below.

<i>Class Interval</i>	<i>Frequency</i>
20 to < 25	8
25 to < 30	6
30 to < 35	5
35 to < 40	12
40 to < 45	15
45 to < 50	7

What is the relative frequency for the largest interval?

- A. .132
- B. .226
- C. .231
- D. .283**
- E. .288

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 3 Hard

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data

68. A company collected the ages from a random sample of its middle managers, with the resulting frequency distribution shown below.

<i>Class Interval</i>	<i>Frequency</i>
20 to < 25	8
25 to < 30	6
30 to < 35	5
35 to < 40	12
40 to < 45	15
45 to < 50	7

What is the midpoint of the third class interval?

- A. 22.5
- B. 27.5
- C. 32.5**
- D. 37.5
- E. 42.5

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 3 Hard

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data

69. The general term for a graphical display of categorical data made up of vertical or horizontal bars is called a(n) \_\_\_\_\_.

- A. pie chart
- B. Pareto chart
- C. bar chart**
- D. ogive plot

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.*

*Topic: Graphically Summarizing Qualitative Data*

70. A flaw possessed by a population or sample unit is \_\_\_\_\_.

- A. always random
- B. a defect**
- C. displayed by a dot plot
- D. the cause for extreme skewness to the right

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-02 Construct and interpret Pareto charts.*

*Topic: Graphically Summarizing Qualitative Data*

71. A graphical portrayal of a quantitative data set that divides the data into classes and gives the frequency of each class is a(n) \_\_\_\_\_.

- A. ogive plot
- B. dot plot
- C. histogram**
- D. Pareto chart
- E. bar chart

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

*Topic: Graphically Summarizing Quantitative Data*

72. The number of measurements falling within a class interval is called the \_\_\_\_\_.

- A. frequency
- B. relative frequency
- C. leaf
- D. cumulative sum

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data*

73. A relative frequency curve having a long tail to the right is said to be \_\_\_\_\_.

- A. skewed to the left
- B. normal
- C. a scatter plot
- D. skewed to the right

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data*

74. The percentage of measurements in a class is called the \_\_\_\_\_ of that class.

- A. frequency
- B. relative frequency
- C. leaf
- D. cumulative percentage

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data*

75. A histogram that tails out toward larger values is \_\_\_\_\_.

- A. skewed to the left
- B. normal
- C. a scatter plot
- D. skewed to the right

*AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data*

76. A histogram that tails out toward smaller values is \_\_\_\_\_.

- A. skewed to the left
- B. normal
- C. a scatter plot
- D. skewed to the right

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

77. A very simple graph that can be used to summarize a quantitative data set is called a(n) \_\_\_\_\_.

- A. runs plot
- B. ogive plot
- C. dot plot
- D. pie chart

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium

Learning Objective: 02-04 Construct and interpret dot plots.

Topic: Dot Plots

78. An example of manipulating a graphical display to distort reality is \_\_\_\_\_.

- A. starting the axes at zero
- B. making the bars in a histogram equal widths
- C. stretching the axes
- D. starting the axes at zero and stretching the axes

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium

Learning Objective: 02-08 Recognize misleading graphs and charts.

Topic: Misleading Graphs and charts

79. As a general rule, when creating a stem-and-leaf display, there should be \_\_\_\_\_ stem values.

- A. between 3 and 10
- B. between 1 and 100
- C. no fewer than 20
- D. between 5 and 20

AACSB: Reflective Thinking  
Blooms: Remember  
Difficulty: 2 Medium

Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.

Topic: Stem-and-Leaf Displays

80. At the end of their final exam, 550 students answered an additional question in which they rated their instructor's teaching effectiveness, with the following results.

Student's Final Grade	Student's Rating of Instructor	
	Very or Somewhat Effective	Very or Somewhat Ineffective
A	190	85
B	75	120
C	20	17
D	9	18
F	1	15

What proportion of the students who rated their instructor as very or somewhat effective received a B or better in the class?

- A. 0.345
- B. 0.254
- C. 0.482
- D. 0.898**
- E. 0.644

*AACSB: Analytical Thinking  
 Blooms: Apply  
 Difficulty: 3 Hard  
 Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.  
 Topic: Contingency Tables*

81. At the end of their final exam, 550 students answered an additional question in which they rated their instructor's teaching effectiveness, with the following results.

Student's Final Grade	Student's Rating of Instructor	
	Very or Somewhat Effective	Very or Somewhat Ineffective
A	190	85
B	75	120
C	20	17
D	9	18
F	1	15

What proportion of the students who rated their instructor as very or somewhat effective received a B or better in the class?

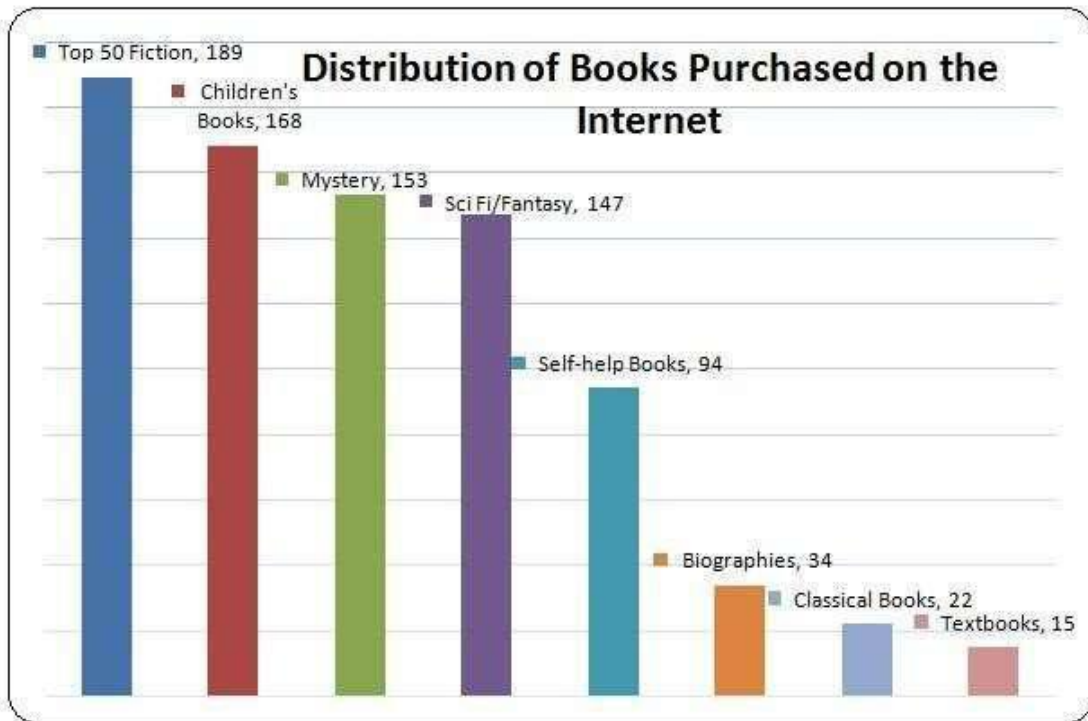
- A. 0.03
- B. 0.06
- C. 0.08**
- D. 0.13
- E. 0.15



AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 3 Hard  
Topic: Contingency Tables

Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.

82. 822 customers were randomly selected from those who had recently bought a book over the Internet. The chart below shows the breakdown of the classification of the book type.



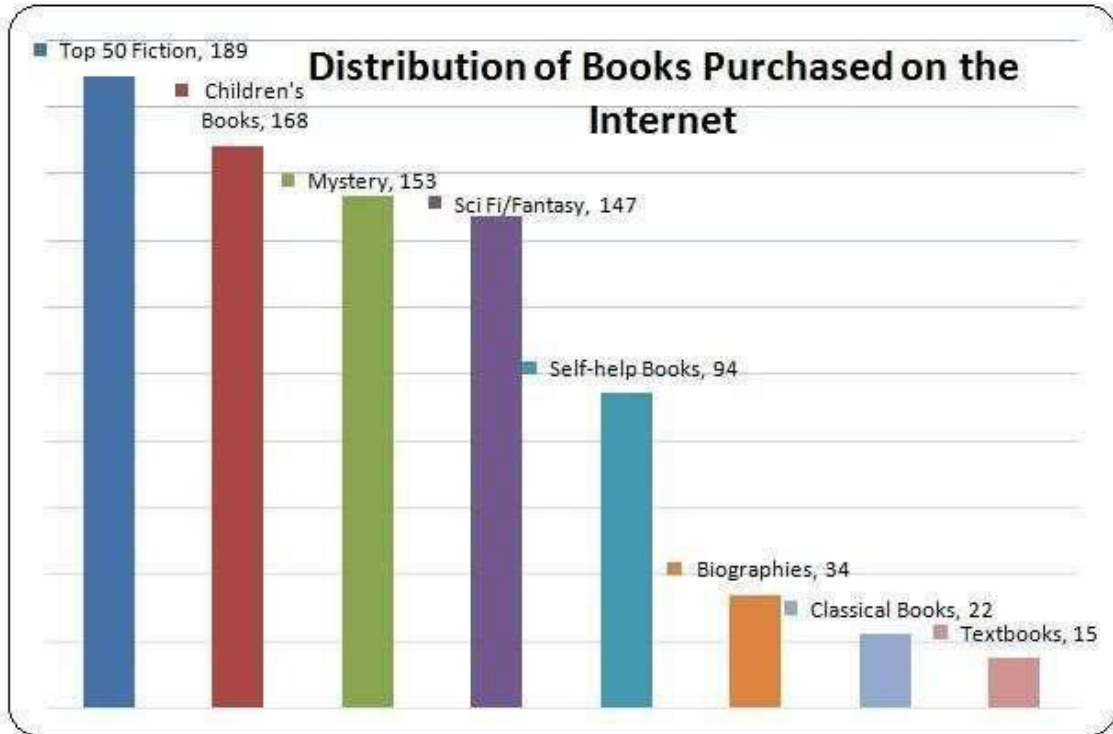
What percentage of the books purchased were either mystery or science fiction/fantasy?

- A. 18.61
- B. 36.50**
- C. 17.88
- D. 24.33
- E. 22.99

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium  
Topic: Graphically Summarizing Qualitative Data

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.

83. 822 customers were randomly selected from those who had recently bought a book over the Internet. The chart below shows the breakdown of the classification of the book type.



What percentage of the books purchased were self-help books?

- A. 11.44
- B. .1144
- C. 1.82
- D. 0.0182
- E. 0.940

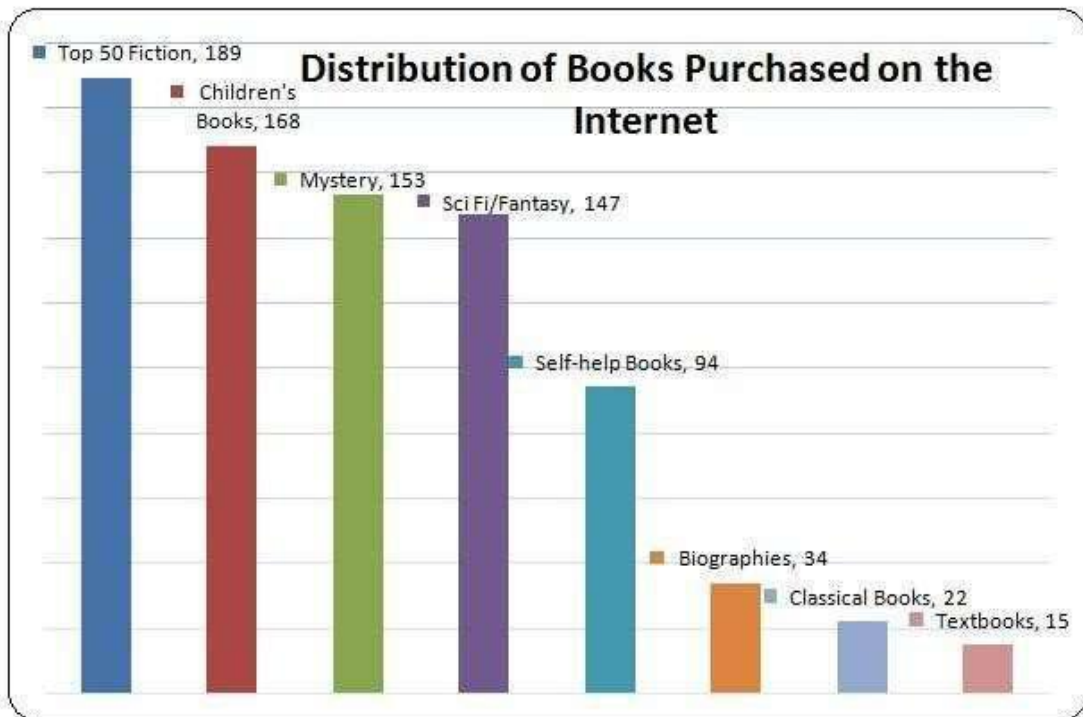
AACSB: Analytical Thinking  
Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.

Topic: Graphically Summarizing Qualitative Data

84. 822 customers were randomly selected from those who had recently bought a book over the Internet. The chart below shows the breakdown of the classification of the book type.



What percentage of the books were in the top two categories?

- A. 22.99
- B. 20.44
- C. 4.50
- D. 43.43**
- E. 0.4343

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.

Topic: Graphically Summarizing Qualitative Data

85. Using the following data, describe the shape of the data distribution.

1.	11.5	6.	13.7	11.	11.0	16.	14.5
2.	13.5	7.	14.0	12.	13.0	17.	15.5
3.	12.5	8.	12.0	13.	16.7	18.	13.0
4.	15.2	9.	12.7	14.	12.5	19.	18.2
5.	14.7	10.	12.5	15.	11.5	20.	11.7

- A. skewed to the left
- B. bimodal
- C. normal
- D. skewed to the right

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Qualitative Data

86. Using the following data, what would be the range of the values of the stem in a stem-and-leaf display?

1.	11.5	6.	13.7	11.	11.0	16.	14.5
2.	13.5	7.	14.0	12.	13.0	17.	15.5
3.	12.5	8.	12.0	13.	16.7	18.	13.0
4.	15.2	9.	12.7	14.	12.5	19.	18.2
5.	14.7	10.	12.5	15.	11.5	20.	11.7

- A. 11-17
- B. 11-18
- C. 10-18
- D. 12-17
- E. 12-18

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.

Topic: Stem-and-Leaf Displays

87. Using the following data, what would be the leaf unit in a stem-and-leaf display?

1.	11.5	6.	13.7	11.	11	16.	14.5
2.	13.5	7.	14	12.	13	17.	15.5
3.	12.5	8.	12	13.	16.7	18.	13
4.	15.2	9.	12.7	14.	12.5	19.	18.2
5.	14.7	10.	12.5	15.	11.5	20.	11.7

- A. 1.0
- B. 10
- C. .10**
- D. .01
- E. .20

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.

Topic: Stem-and-Leaf Displays

88. Consider the following data on distances traveled by people to visit the local amusement park and calculate the relative frequency for the shortest distance.

Distance	Frequency
1–8 miles	15
9–16 miles	12
17–24 miles	7
25–32 miles	5
33–40 miles	1

- A. .375**
- B. .150
- C. .500
- D. .300
- E. .333

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 1 Easy

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

89. Consider the following data on distances traveled by people to visit the local amusement park and calculate the relative frequency for the distances over 24 miles.

Distance	Frequency
1–8 miles	15
9–16 miles	12
17–24 miles	7
25–32 miles	5
33–40 miles	1

- A. .375  
**B. .150**  
C. .125  
D. .025  
E. .325

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data

90. The following is a partial relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	?
C	.18
D	.17
F	.06

Find the relative frequency for the B grade.

- A. .78  
B. .27  
C. .65  
**D. .37**  
E. .47

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 1 Easy

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.  
Topic: Graphically Summarizing Qualitative Data

91. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	?
C	.18
D	.17
F	.06

If this was the distribution of 200 students, find the frequency for the highest two grades.

- A. 44
- B. 118**
- C. 59
- D. 74
- E. 35

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.  
Topic: Graphically Summarizing Qualitative Data

92. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	?
C	.18
D	.17
F	.06

If this was the distribution of 200 students, find the frequency of failures.

- A. 12**
- B. 6
- C. 23
- D. 46
- E. 3

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.  
Topic: Graphically Summarizing Qualitative Data

93. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	?
C	.18
D	.17
F	.06

If we wish to depict these data using a pie chart, find how many degrees should be assigned to the highest grade of A.

- A. 61.1
- B. 22.0
- C. 79.2**
- D. 90.0
- E. 212.40

AACSB: Analytical Thinking  
 Blooms: Apply  
 Difficulty: 3 Hard

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.

Topic: Graphically Summarizing Qualitative Data

94. Recently an advertising company called 200 people and asked them to identify the company that was in an ad running nationwide. The following results were obtained.

	Female	Male	Total
Correctly recalled the company	66	50	116
Incorrectly recalled the company	44	40	84
Total	110	90	200

What percentage of those surveyed were female and could not recall the company?

- A. 40.0
- B. 22.0**
- C. 52.4
- D. 66.7
- E. 37.9

AACSB: Analytical Thinking  
 Blooms: Apply  
 Difficulty: 2 Medium

Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.

Topic: Contingency Tables



95. Recently an advertising company called 200 people and asked them to identify the company that was in an ad running nationwide. The following results were obtained.

	Female	Male	Total
Correctly recalled the company	66	50	116
Incorrectly recalled the company	44	40	84
Total	110	90	200

What percentage of those surveyed could not correctly recall the company?

- A. 58.00
- B. 56.89
- C. 55.00
- D. 43.10
- E. 42.00

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.

Topic: Cross-tabulation

96. A local electronics retailer recently conducted a study on purchasers of large screen televisions. The study recorded the type of television and the credit account balance of the customer at the time of purchase. They obtained the following results.

Credit Balance	LED	LCD	Plasma	Projection
Under \$200	10	16	40	5
\$200–\$800	8	12	24	15
Over \$800	16	12	16	30
Total	34	40	80	50

What percentage of purchases were plasma televisions by customers with the smallest credit balances?

- A. 50.00
- B. 39.20
- C. 56.30
- D. 34.80
- E. 19.60

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.

Topic: Contingency Tables

97. A local electronics retailer recently conducted a study on purchasers of large screen televisions. The study recorded the type of television and the credit account balance of the customer at the time of purchase. They obtained the following results.

Credit Balance	LED	LCD	Plasma	Projection
Under \$200	10	16	40	5
\$200–\$800	8	12	24	15
Over \$800	16	12	16	30
Total	34	40	80	50

What percentage of the customers had the highest credit balances and purchased an LCD television?

- A. 36.30
- B. 5.90**
- C. 19.60
- D. 56.30
- E. 16.20

*AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium  
Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.  
Topic: Contingency Tables*

98. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below. 24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46, 31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50

- A. 4
- B. 6
- C. 10
- D. 5**
- E. 2

*AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium  
Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.  
Topic: Graphically Summarizing Quantitative Data*

99. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below.  
24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46, 31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40,  
50 What is the shape of the distribution of the data?

- A. skewed with tail to the right
- B. skewed with tail to the left
- C. normal
- D. bimodal

*AACSB: Analytical Thinking*

*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

*Topic: Graphically Summarizing Qualitative Data*

100. The number of items rejected daily by a manufacturer because of defects for the last 30 days are:  
20, 21, 8, 17, 22, 19, 18, 19, 14, 17, 11, 6, 21, 25, 4, 19, 9, 12, 16, 16, 10, 28, 24, 6, 21, 20, 25,  
5, 17, 8

How many classes should be used in constructing a histogram?

- A. 6
- B. 5**
- C. 7
- D. 4
- E. 8

*AACSB: Analytical Thinking*

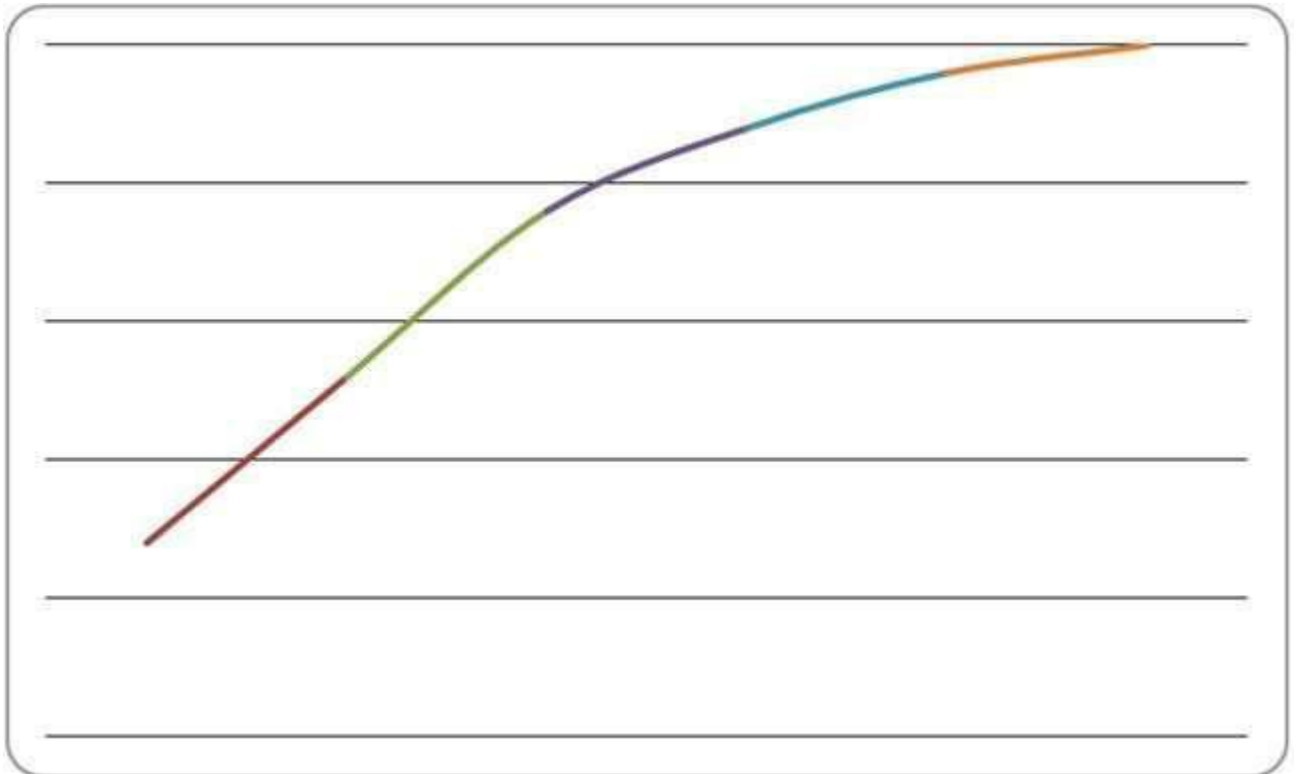
*Blooms: Apply*

*Difficulty: 2 Medium*

*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

*Topic: Graphically Summarizing Quantitative Data*

101. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below. 24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46, 31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50 Construct an ogive plot.



Feedback: Create a frequency table with cumulative relative frequency and then construct the graph using the cumulative frequency points.

Classes	Frequency	RelFreq	Cum RelFreq
24 < 31	7	0.28	0.28
31 < 38	8	0.32	0.60
38 < 45	6	0.24	0.84
45 < 52	3	0.12	0.96
52 < 57	1	0.04	1.00

102. The number of items rejected daily by a manufacturer because of defects for the last 30 days are:

20, 21, 8, 17, 22, 19, 18, 19, 14, 17, 11, 6, 21, 25, 4, 19, 9, 12, 16, 16, 10, 28, 24, 6, 21, 20, 25, 5, 17, 8

Complete this frequency table for these data.

	Frequency	Rel Freq	Cum Freq
4 < 9			
9 < 14			
14 < 19			
19 < 24			
24 < 29			

	Frequency	Rel Freq	Cum Freq
4 < 9	6	.2	.2
9 < 14	4	.133	.333
14 < 19	7	.233	.5667
19 < 24	9	.30	.8667
24 < 29	4	.133	1.00

Feedback: Using the given classes, frequency = number of rejected items in each class, relative frequency = frequency/30, and cumulative frequency = sum of successive class relative frequencies.

103. The number of items rejected daily by a manufacturer because of defects for the last 30 days are:

20, 21, 8, 17, 22, 19, 18, 19, 14, 17, 11, 6, 21, 25, 4, 19, 9, 12, 16, 16, 10, 28, 24, 6, 21, 20, 25, 5, 17, 8

Construct a stem-and-leaf plot.

Stem-and-leaf of Rejected Items

N = 30

Leaf Unit = 1.0

2	0	45
4	0	66
7	0	889
8	1	1
9	1	2
10	1	4
14	1	6777
(4)	1	8999
12	2	000111
6	2	2
5	2	455
2	2	6
1	2	9

Feedback: Stem should be the 10s unit. Construct by splitting stems, since the range of values is only 5-28 and there should be approximately 10 stems. When splitting the stem, consider the number of values in the split stems. Leaf unit should be the ones unit.

*AACSB: Analytical Thinking*

*Blooms: Apply*

*Difficulty: 2 Medium*

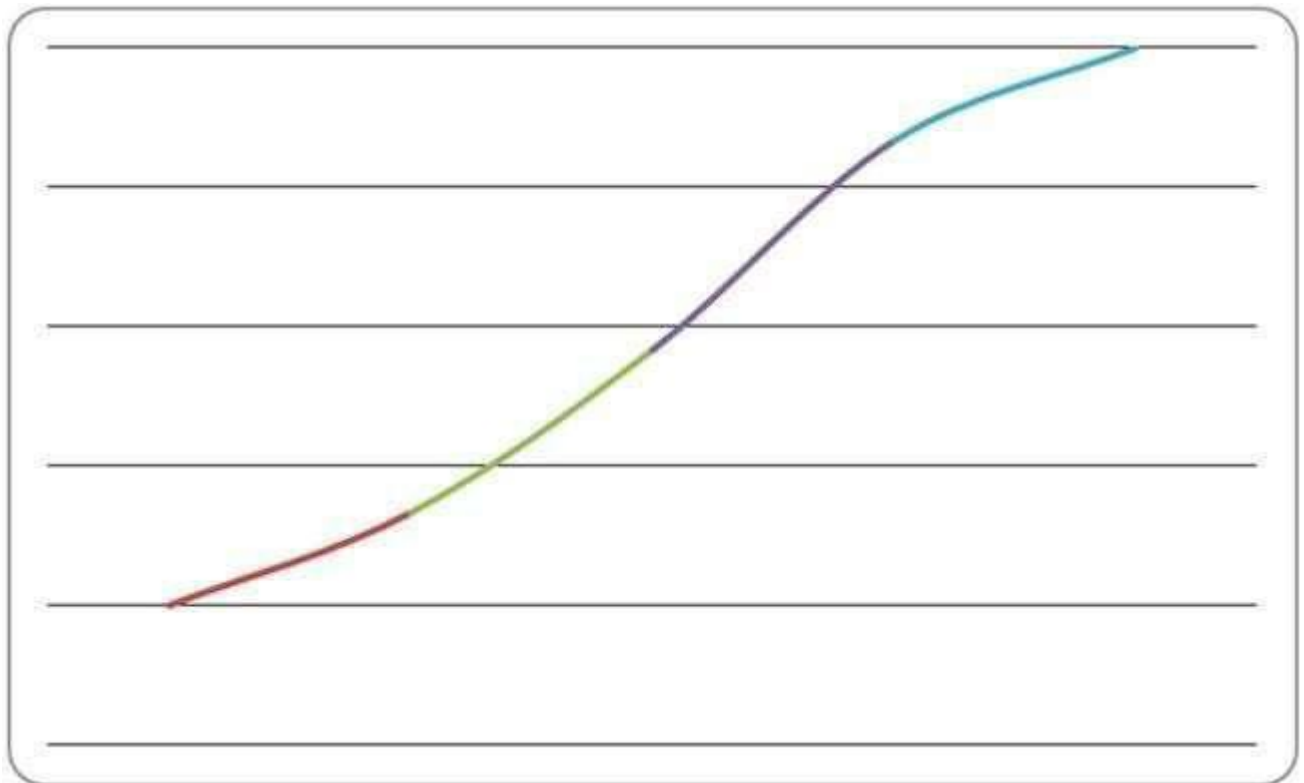
*Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.*

*Topic: Stem-and-Leaf Displays*

104. The number of items rejected daily by a manufacturer because of defects for the last 30 days are:

20, 21, 8, 17, 22, 19, 18, 19, 14, 17, 11, 6, 21, 25, 4, 19, 9, 12, 16, 16, 10, 28, 24, 6, 21, 20, 25, 5, 17, 8

Construct an ogive plot.



Construct a frequency table (5 classes) with cumulative relative frequency.

Classes	Frequency	RelFreq	Cum RelFreq
4<9	6	0.20	0.20
9<14	4	0.13	0.33
14<19	7	0.23	0.57
19<24	9	0.30	0.87
24<29	4	0.13	1.00

AACSB: Analytical Thinking  
Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

105. Consider the following data.

1.	11.5	6.	13.7	11.	11.0	16.	14.5
2.	13.5	7.	14.0	12.	13.0	17.	15.5
3.	12.5	8.	12.0	13.	16.7	18.	13.0
4.	15.2	9.	12.7	14.	12.5	19.	18.2
5.	14.7	10.	12.5	15.	11.5	20.	11.7

Create a stem-and-leaf display for the sample.

Stem-and-leaf of C1, N = 20, Leaf Unit = 0.10

4	11	0557
9	12	05557
(4)	13	0057
7	14	057
4	15	25
2	16	7
1	17	
1	18	2

Feedback: Stems should be from 11 to 18; leaves are the tenth unit.

AACSB: Analytical Thinking  
Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.

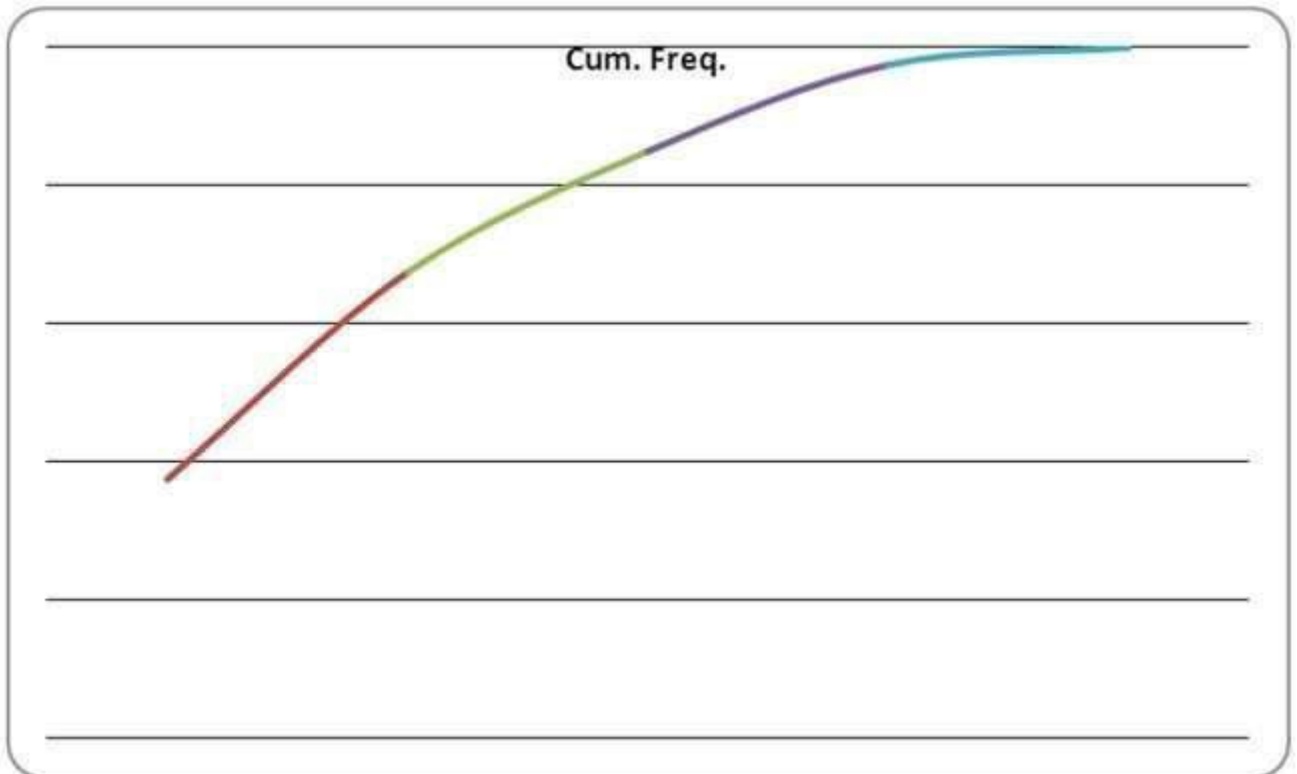
Topic: Stem-and-Leaf Displays



106. Consider the following data on distances traveled by people to visit the local amusement park.

Distance	Frequency
1–8 miles	15
9–16 miles	12
17–24 miles	7
25–32 miles	5
33–40 miles	1

Construct an ogive plot that corresponds to the frequency table.



Feedback: Calculate the relative frequency for each class ( $15/40$ ,  $12/40$ ,  $7/40$ ,  $5/40$ ,  $1/40$ ; or  $.375$ ,  $.30$ ,  $.175$ ,  $.125$ , and  $.025$ ) and then the cumulative frequency ( $.375$ ,  $.675$ ,  $.850$ ,  $.975$ ,  $1.00$ ).

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

107. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	.37
C	.18
D	.17
F	.06

If this was the distribution of 200 students, give the frequency distribution for this data.

Grade	Frequency
A	44
B	74
C	36
D	34
F	12

Feedback: Convert from proportion (relative frequency) to frequency by multiplying each relative frequency by 200 (e.g.,  $.22 \times 200 = 44$  for grade A).

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 2 Medium

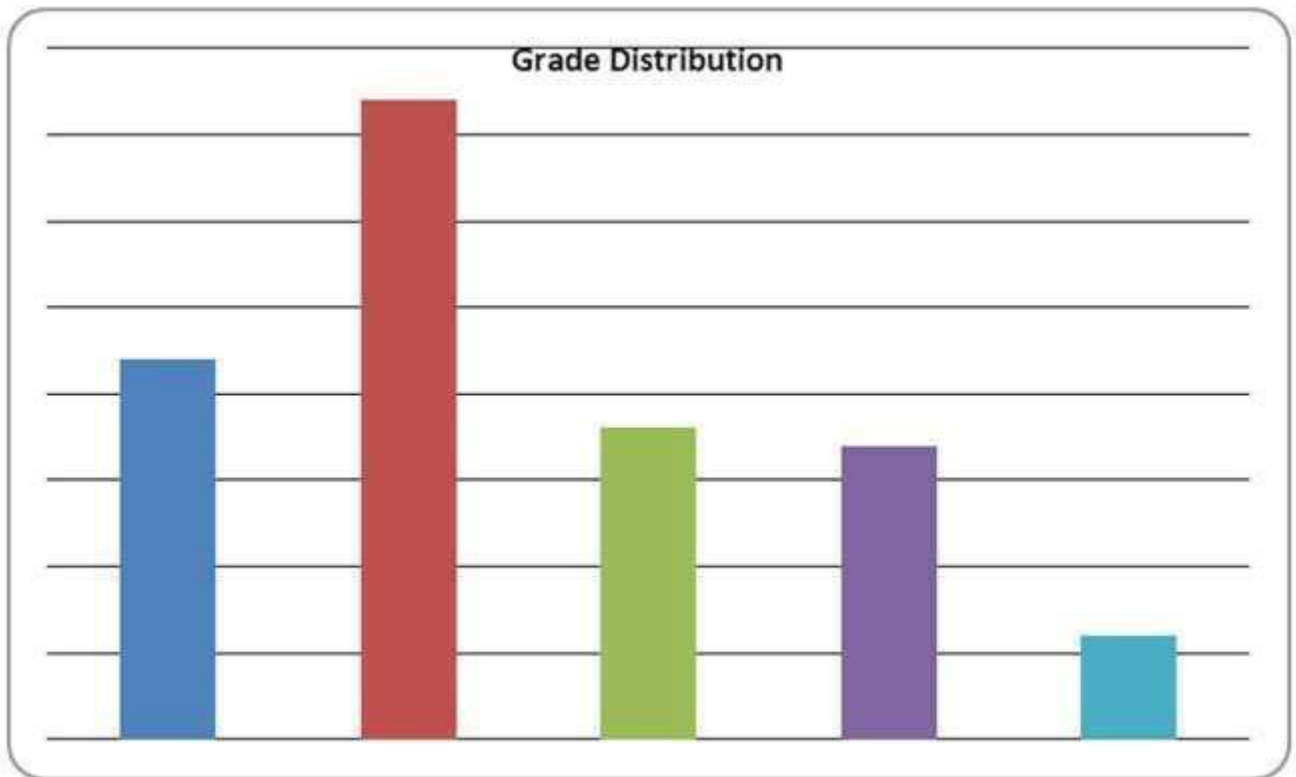
Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.

Topic: Graphically Summarizing Quantitative Data

108. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	.37
C	.18
D	.17
F	.06

Construct a percent frequency bar chart for this data.



Feedback: Each grade category is displayed as a bar on a proportion bar chart.

AACSB: Analytical Thinking  
Blooms: Apply  
Difficulty: 1 Easy

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.  
Topic: Graphically Summarizing Quantitative Data

109. The following is a relative frequency distribution of grades in an introductory statistics course.

Grade	Relative Frequency
A	.22
B	.37
C	.18
D	.17
F	.06

If we wish to depict these data using a pie chart, find how many degrees (out of 360 degrees) should be assigned to each grade.

Grade	Circle Degrees
A	$.22 \times 360 = 79.2$
B	$.37 \times 360 = 133.2$
C	$.18 \times 360 = 64.8$
D	$.17 \times 360 = 61.2$
F	$.06 \times 360 = 21.6$

Feedback: Each proportion (relative frequency) is considered that portion of a circle's 360 degrees. Multiply the relative frequency (proportion) by 360 to convert to actual circle degrees (e.g., grade A:  $.22 \times 360 = 79.2$  degrees).

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.

Topic: Graphically Summarizing Quantitative Data

110. Fill in the missing components of the following frequency distribution constructed for a sample size of 50.

Class	Frequency	Rel Frequency	Cum RelFreq
_____ < 7.95			0.12
_____ < 8.05			0.48
8.05 < _____		0.24	
_____ < 8.25		0.10	
8.25 < _____			

Class	Frequency	Rel Frequency	Cum RelFreq
7.85 < 7.95	6	0.12	0.12
7.95 < 8.05	18	0.36	0.48
8.05 < 8.15	12	0.24	0.72
8.15 < 8.25	5	0.10	0.82
8.25 < 8.35	9	0.18	1.00

Feedback: Work each row to generate the missing frequency and/or relative frequency given a sample size of 50. For example, first class: cum rel freq = rel freq =  $x/50 = 0.12$ , so  $x = 6$ . Complete the class interval by recognizing that the second class beginning boundary is the end of the first interval's boundary and using the class length calculated in the second class (0.10) to apply to all other classes.

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 3 Hard

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

111. Recently an advertising company called 200 people and asked them to identify the company that was in an ad running nationwide. They obtained the following results.

	Female	Male	Total
Correctly recalled the company	66	50	116
Incorrectly recalled the company	44	40	84
Total	110	90	200

Construct a table of row percentages.

	Female	Male
Correctly recalled	$66/116=0.569$	$50/116=0.431$
Incorrectly recalled	$44/84=0.524$	$40/84=0.476$

Feedback: Row percentages are calculated by dividing each part of the row by the total of the row. For example, Female and correctly recalled = 66, which yields a row percentage of  $66/116 = 0.569$ .

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.

Topic: Contingency Tables

112. Recently an advertising company called 200 people and asked them to identify the company that was in an ad running nationwide. They obtained the following results.

	Female	Male	Total
Correctly recalled the company	66	50	116
Incorrectly recalled the company	44	40	84
Total	110	90	200

Construct a table of column percentages.

	Female	Male
Correctly recalled	$66/110=0.6$	$50/90=0.556$
Incorrectly recalled	$44/110=0.4$	$40/90=0.444$

Feedback: Column percentages are calculated by dividing each part of the column by the total of the column. For example, Female and correctly recalled = 66, which yields a column percentage of  $66/110 = 0.60$ .

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.

Topic: Contingency Tables

113. A local electronics retailer recently conducted a study on purchasers of large screen televisions. The study recorded the type of television and the credit account balance of the customer at the time of purchase. They obtained the following results.

Credit Balance	LED	LCD	Plasma	Projection
Under \$200	10	16	40	5
\$200–\$800	8	12	24	15
Over \$800	16	12	16	30
Total	34	40	80	50

Construct a table of row percentages.

Credit Balance	LED	LCD	Plasma	Projection
Under \$200	$10/71 = 0.141$	$16/71 = 0.225$	$40/71 = 0.563$	$5/71 = 0.070$
\$200–\$800	$8/59 = 0.136$	$12/59 = 0.203$	$24/59 = 0.407$	$15/59 = 0.254$
Over \$800	$16/74 = 0.216$	$12/74 = 0.162$	$16/74 = 0.216$	$30/74 = 0.405$

Feedback: Row percentages are calculated by dividing each part of the row by the total of the row. Need to calculate the totals for each row (under \$200 = 71; \$200-\$800 = 59; over \$800 = 74). For example, credit balance under \$200 and LCD TV = 16, which yields row percentage  $16/71 = 0.225$ .

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.

Topic: Contingency Tables

114. A local electronics retailer recently conducted a study on purchasers of large screen televisions. The study recorded the type of television and the credit account balance of the customer at the time of purchase. They obtained the following results.

Credit Balance	LED	LCD	Plasma	Projection
Under \$200	$10/71 = 0.141$	$16/71 = 0.225$	$40/71 = 0.563$	$5/71 = 0.070$
\$200–\$800	$8/59 = 0.136$	$12/59 = 0.203$	$24/59 = 0.407$	$15/59 = 0.254$
Over \$800	$16/74 = 0.216$	$12/74 = 0.162$	$16/74 = 0.216$	$30/74 = 0.405$

Construct a table of column percentages.

Credit Balance	LED	LCD	Plasma	Projection
Under \$200	$10/34 = 0.294$	$16/40 = 0.4$	$40/80 = 0.5$	$5/50 = 0.1$
\$200–\$800	$8/34 = 0.235$	$12/40 = 0.3$	$24/80 = 0.3$	$15/50 = 0.3$
Over \$800	$16/34 = 0.471$	$12/40 = 0.3$	$16/80 = 0.2$	$30/50 = 0.6$

Feedback: Column percentages calculated by dividing each part of the column by the total of the column. For example, credit balance under \$200 and LCD TV = 16 yields row percentage  $16/40 = 0.40$ .

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.

Topic: Contingency Tables

115. Math test anxiety can be found throughout the general population. A study of 116 seniors at a local high school was conducted. The following table was produced from the data. Complete the missing parts.

Score Range	Frequency	Rel Frequency	Cum Freq Dist
Very anxious 37–50		0.19	
Anxious/tense 33–36	8		0.26
Some mild anxiety 27–32			
Generally relaxed 20–26	24		0.67
Very relaxed 10–19		0.33	

Score Range	Frequency	Rel Frequency	Cum Freq Dist
Very anxious 37–50	22	0.19	0.19
Anxious/tense 33–36	8	0.07	0.26
Some mild anxiety 27–32	24	0.207	0.467
Generally relaxed 20–26	24	0.207	0.674
Very relaxed 10–19	38	0.33	1.00

Feedback: Work each row to generate the missing frequency and/or relative frequency given a sample size of 116. For example, first class cum freq = rel freq =  $x/116 = 0.19$ , so  $x = 22$ . Use the definition of cumulative frequency, which is the sum of the class relative frequency and the previous class cumulative frequency (for example, "generally relaxed" relative frequency =  $24/116 = .207$ , which with a cumulative frequency of .67 gives the previous class of "some mild anxiety" a cumulative frequency of .47).

AACSB: Analytical Thinking

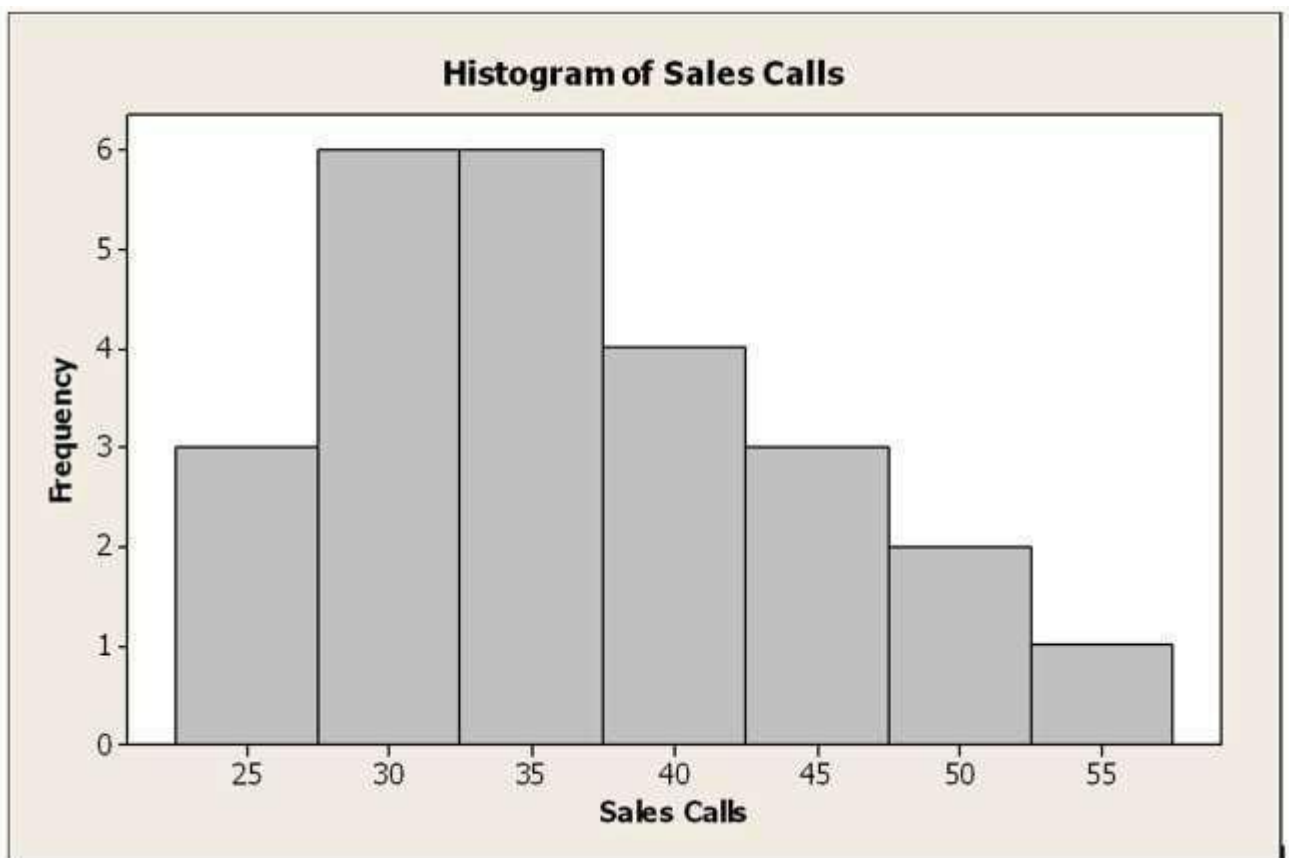
Blooms: Apply

Difficulty: 3 Hard

Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.

Topic: Graphically Summarizing Qualitative Data

116. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below. 24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46, 31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50 Construct a histogram.



Feedback: Construct a frequency table. You can use five to seven classes, depending on your choice and calculation of length as a whole integer.



Classes - Midpoint	Frequency
25	3
30	6
35	6
40	4
45	3
50	2
55	1

AACSB: Analytical Thinking  
 Blooms: Apply  
 Difficulty: 2 Medium

Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.

Topic: Graphically Summarizing Quantitative Data

117. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below. 24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46, 31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50 Construct a stem-and-leaf plot.

Stem-and-Leaf of Sales Calls

N = 25

Leaf Unit = 1.0

```

1   2   4
7   2  778899
12  3  11334
(5) 3  57788
8   4  0134
4   4  68
2   5  0
1   5  6

```

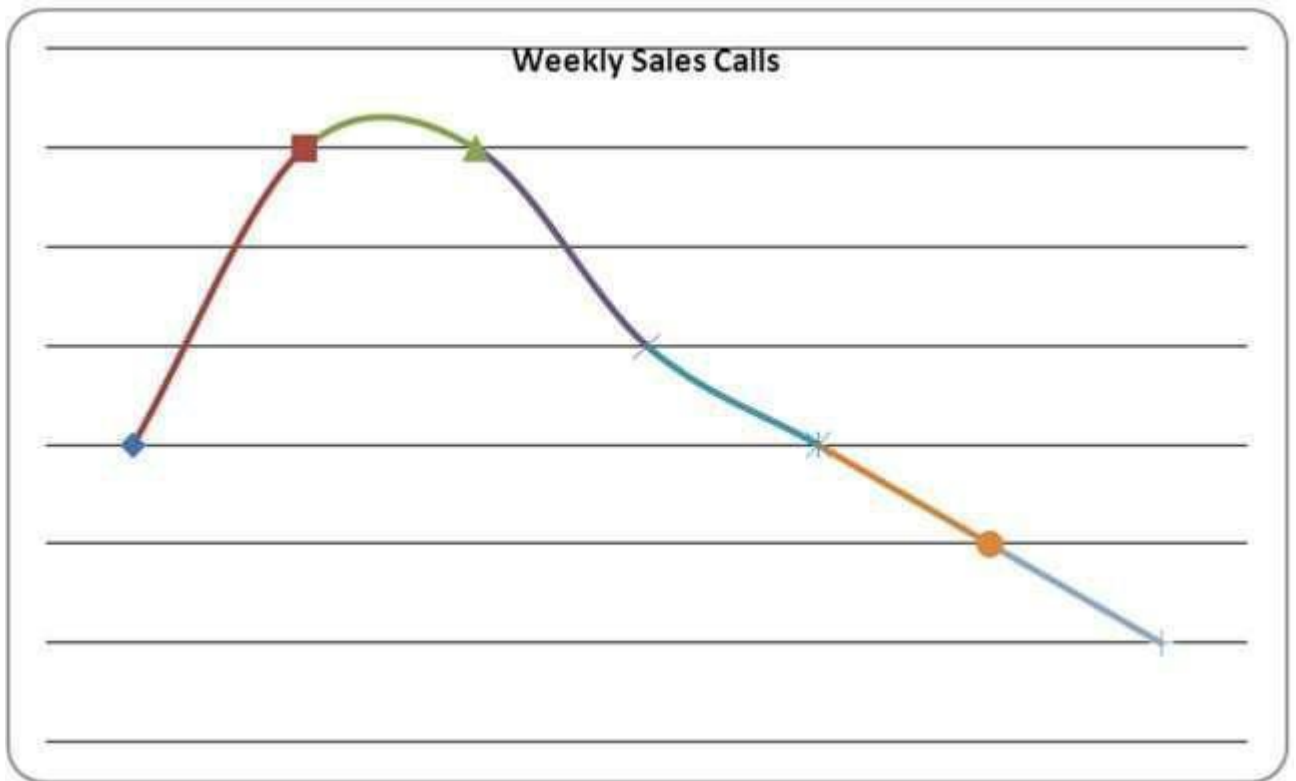
Feedback: The stem should be split and consist of 20, 30, 40, and 50. Leaves are the single units for the number of sales calls (e.g., 20 stem: leaves = 4, 7, 7, 8, 8, 9, 9).

AACSB: Analytical Thinking  
 Blooms: Apply  
 Difficulty: 2 Medium

Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.

Topic: Stem-and-Leaf Displays

118. The number of weekly sales calls by a sample of 25 pharmaceutical salespersons is below. 24, 56, 43, 35, 37, 27, 29, 44, 34, 28, 33, 28, 46, 31, 38, 41, 48, 38, 27, 29, 37, 33, 31, 40, 50 Construct a frequency polygon.



Feedback: The frequency polygon is the line connecting the height (frequency) of the midpoint of each class. Construct a frequency table.

Classes - Midpoint	Frequency
25	3
30	6
35	6
40	4
45	3
50	2
55	1

*AACSB: Analytical Thinking*

*Blooms: Apply*

*Difficulty: 2 Medium*

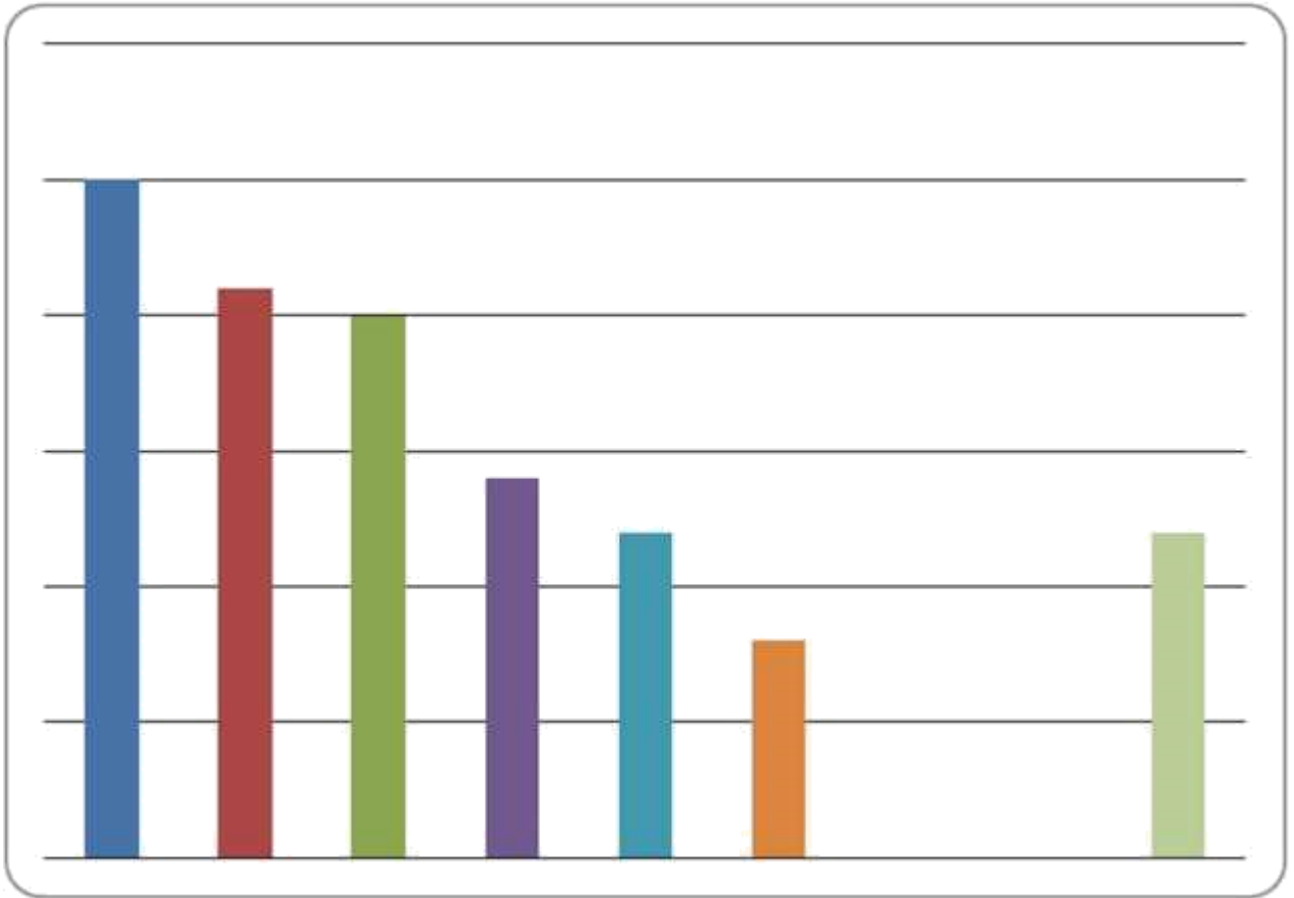
*Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.*

*Topic: Graphically Summarizing Quantitative Data*

119. The following table lists the types of customer complaint calls on satellite TV service during the first two months after installation.

No signal detected	20%
Can't receive local channels	14%
Missing channels	21%
Intermittent reception	8%
Remote control problems	25%
Other issues	12%

Construct a Pareto chart.



Feedback: A Pareto chart is a specialization of the bar chart used for categorical variables. The largest percentage value is charted at the far left, and each problem percentage is graphed in decreasing order. When showing "other" issues, always place that bar to the right because it includes an accumulation of various reasons.

*AACSB: Analytical Thinking  
 Blooms: Apply  
 Difficulty: 2 Medium  
 Learning Objective: 02-02 Construct and interpret Pareto charts.  
 Topic: Graphically Summarizing Qualitative Data  
 Topic: Graphically Summarizing Quantitative Data*

120. The following data consist of the number of sick days taken by the 100 employees at a small manufacturing company for the past 18 months. Construct a dot plot of these data and describe the distribution.

5, 1, 4, 8, 0, 6, 3, 5, 3, 4, 7, 15, 5, 8, 2, 1, 5, 4



Data are skewed to the right with one outlier. Over half of the data lie in the 4-5 day range.

Feedback: A dot plot is constructed as a number line with minimum to maximum values (0 to 15). Individual values are shown along the line as points (dots). With an outlier at the maximum value, the shape has a tail to the right.

AACSB: Analytical Thinking

Blooms: Apply

Difficulty: 2 Medium

Learning Objective: 02-04 Construct and interpret dot plots.

Topic: Dot Plots

## Chapter 02 Test Bank - Static Summary

<u>Category</u>	<u># of Questions</u>
AACSB: Analytical Thinking	54
AACSB: Reflective Thinking	66
Blooms: Analyze	1
Blooms: Apply	54
Blooms: Remember	62
Blooms: Understand	3
Difficulty: 1 Easy	14
Difficulty: 2 Medium	93
Difficulty: 3 Hard	13
Learning Objective: 02-01 Summarize qualitative data by using frequency distributions, bar charts, and pie charts.	19
Learning Objective: 02-02 Construct and interpret Pareto charts.	6
Learning Objective: 02-03 Summarize quantitative data using frequency distributions, histograms, frequency polygons, and ogives.	43
Learning Objective: 02-04 Construct and interpret dot plots.	3
Learning Objective: 02-05 Construct and interpret stem-and-leaf displays.	18
Learning Objective: 02-06 Examine the relationships between variables by using contingency tables.	12
Learning Objective: 02-07 Examine the relationships between variables by using scatter plots.	3
Learning Objective: 02-08 Recognize misleading graphs and charts.	15
Learning Objective: 02-09 Construct and interpret gauges, bullet graphs, treemaps, and sparklines.	11
Topic: Contingency Tables	1
Topic: Cross-tabulation	15
Topic: Descriptive Analytics	3
Topic: Dot Plots	26
Topic: Graphically Summarizing Qualitative Data	

Topic: Graphically Summarizing Quantitative Data	40
Topic: Misleading Graphs and charts	3
Topic: Scatter Plots	4
Topic: Stem-and-Leaf Displays	18