

Chapter 2 - Frequency Distributions and Graphs

1. Which of the following does not need to be done when constructing a frequency distribution?

- A) select the number of classes desired
- B) find the range
- C) make the class width an even number
- D) use classes that are mutually exclusive

Ans: C Difficulty: Easy Section: 2.1

2. The lower class limit represents the smallest data value that can be included in the class.

Ans: True Difficulty: Moderate Section: 2.1

3. When data are collected in original form, they are called _____.

Ans: raw data

Difficulty: Easy Section: 2.1

4. The _____ of a specific class is the number of data values contained in it.

Ans: frequency

Difficulty: Easy Section: 2.1

5. If a frequency distribution had class boundaries of 132.5–147.5, what would be the class width?

Ans: 15

Difficulty: Moderate Section: 2.1

6. For the class 10 - 18, the upper class limit is

- A) 9.5 B) 10 C) 18 D) 18.5

Ans: C Difficulty: Easy Section: 2.1

7. What are the boundaries of the class 12-19?

- A) 11.5 and 19.5 B) 8.5 and 22.5 C) 12 and 19 D) 7

Ans: A Difficulty: Easy Section: 2.1

8. In an ungrouped frequency distribution of the average age of high school graduates, what would be the boundaries for the class of graduates who were reported to be 18 years old?

- A) 17–19 years old C) 17.6 – 18.5 years old
- B) 17.5 – 18.5 years old D) 17.6 – 19.5 years old

Ans: B Difficulty: Easy Section: 2.1

9. What is the midpoint of the class 7-11 ?

- A) 9.5 B) 9 C) 5 D) 4

Ans: B Difficulty: Easy Section: 2.1

10. Greg wants to construct a frequency distribution for the political affiliation of the employees at Owen's Hardware Store. What type of distribution would be best?
A) ungrouped B) grouped C) categorical D) cumulative
Ans: C Difficulty: Easy Section: 2.1
11. What is the lower class limit of the class 13–17?
A) 15 B) 17 C) 13 D) 12.5
Ans: C Difficulty: Moderate Section: 2.1
12. What is the midpoint of the class 12–15 ?
A) 1.5 B) 13.5 C) 3 D) 13
Ans: B Difficulty: Easy Section: 2.1
13. What is the upper class boundary of the class 23–35 ?
A) 35 B) 7.5 C) 35.5 D) 7
Ans: C Difficulty: Moderate Section: 2.1
14. If the limits for a class were 20–38, the boundaries would be 19.5–38.5.
Ans: True Difficulty: Easy Section: 2.1
15. For grouped frequency distributions, the _____ is obtained by adding the lower and upper limits and dividing by 2.
Ans: class midpoint
Difficulty: Easy Section: 2.1
16. What is the lower class limit in the class 6-10 ?
A) 6 B) 8 C) 6.5 D) 5.5
Ans: A Difficulty: Moderate Section: 2.1
17. Which of the following pairs of class limits would be appropriate for grouping the numbers 14, 17, 12, and 19 ?
A) 11-15 and 15-19 C) 12-14 and 15-19
B) 12-14 and 17-19 D) 12-15 and 16-19
Ans: D Difficulty: Moderate Section: 2.1
18. Thirty students recorded the colors of their eyes, choosing from the colors brown, blue, green, hazel, and black. This data can be appropriately summarized in a(n) _____.
A) open-ended distribution C) grouped frequency distribution
B) categorical frequency distribution D) upper boundary
Ans: B Difficulty: Moderate Section: 2.1
19. What are the boundaries of the class 1.87–3.43 ?
A) 1.82–3.48 B) 1.87–3.43 C) 1.879–3.439 D) 1.865–3.435
Ans: D Difficulty: Moderate Section: 2.1

20. For the class 16.3–23.8, the width is 8.5.

Ans: False Difficulty: Easy Section: 2.1

21. When the range is large, and classes that are several units in width are needed, a _____ frequency distribution is used.

Ans: grouped

Difficulty: Moderate Section: 2.1

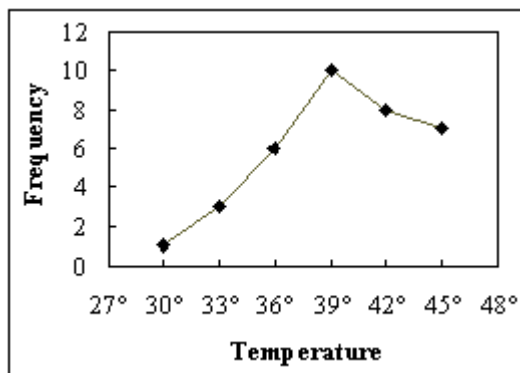
22. The cumulative frequency for a class is the sum of the frequencies of the classes less than and equal to the upper boundary of the specific class.

Ans: True Difficulty: Easy Section: 2.1

23. Construct a frequency polygon from the following frequency distribution.

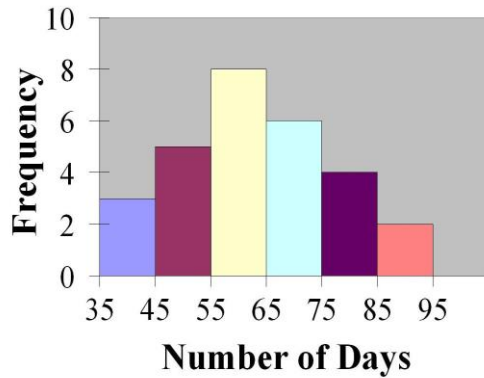
<u>Temperature</u>	<u>Frequency</u>
28.5–31.5	1
31.5–34.5	3
34.5–37.5	6
37.5–40.5	10
40.5–43.5	8
43.5–46.5	7

Ans:



Difficulty: Moderate Section: 2.2

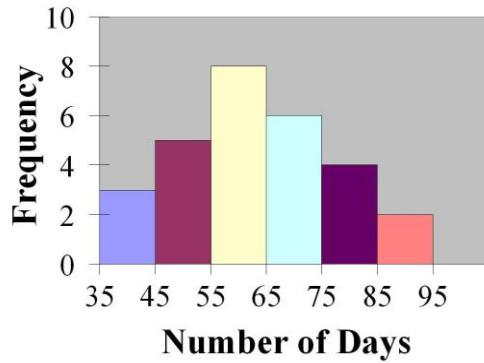
24. Find the class with the least number of data values.



A) 55-65 B) 65-75 C) 75-85 D) 85-95

Ans: D Difficulty: Easy Section: 2.2

25. Find the class with the greatest number of data values.



A) 55-65 B) 65-75 C) 75-85 D) 85-95

Ans: A Difficulty: Easy Section: 2.2

26. An ogive is also called a cumulative frequency graph.

Ans: True Difficulty: Easy Section: 2.2

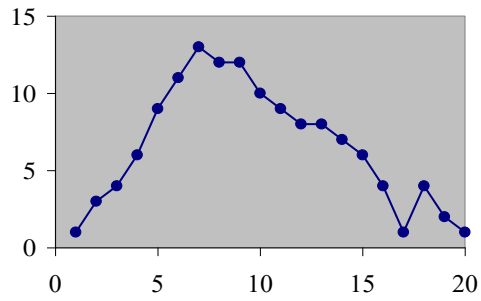
27. The three most commonly used graphs in research are the histogram, the _____, and the cumulative frequency graph (ogive).

Ans: frequency polygon

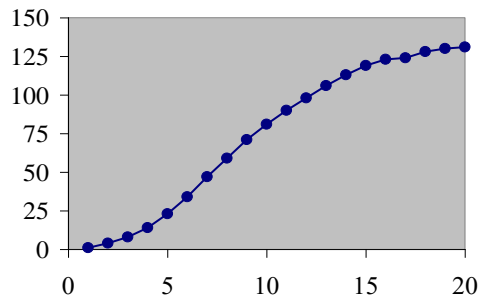
Difficulty: Easy Section: 2.2

28. Which of the following could be a cumulative frequency graph?

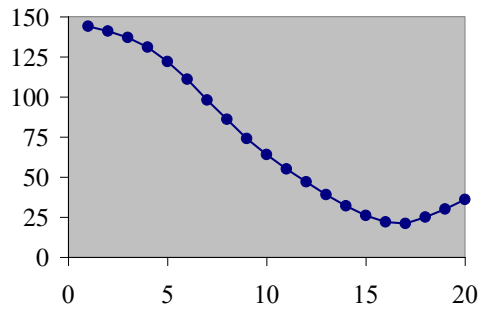
A)



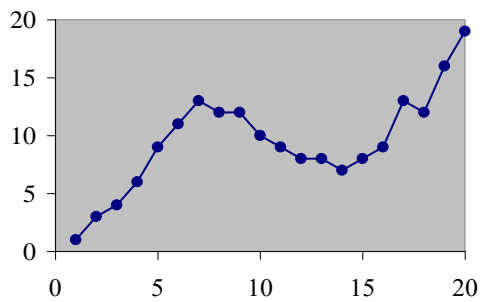
B)



C)



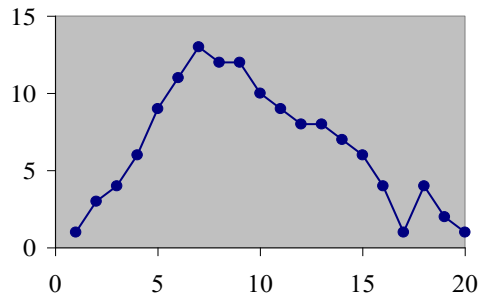
D)



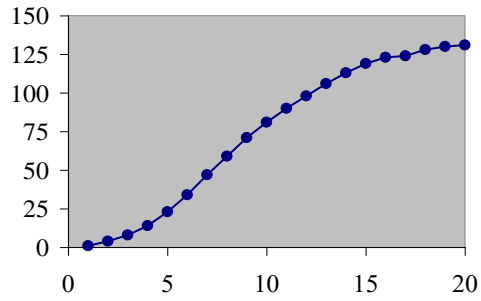
Ans: B Difficulty: Easy Section: 2.2

29. Which of the following could be an ogive?

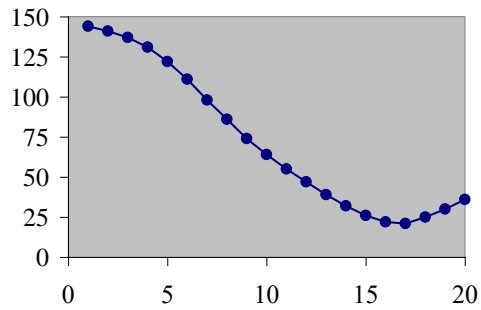
A)



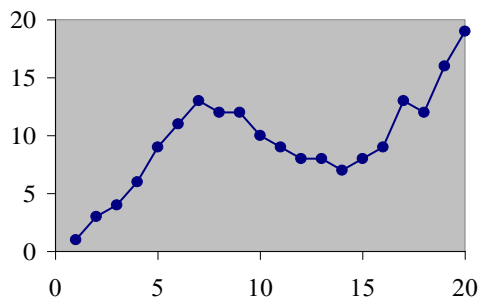
B)



C)



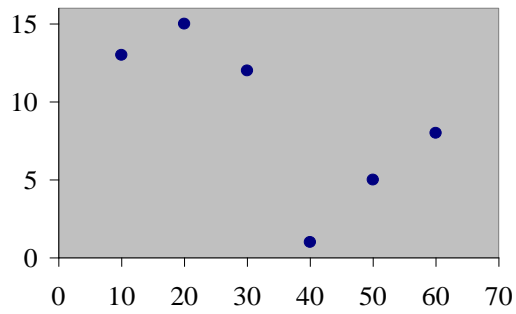
D)



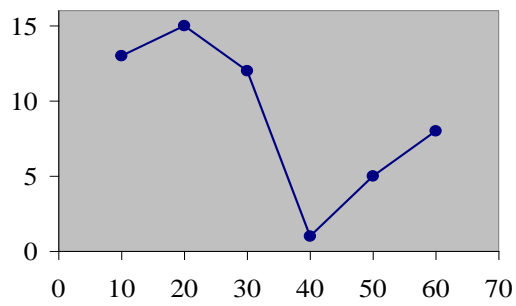
Ans: B Difficulty: Easy Section: 2.2

30. Which of the following is a histogram?

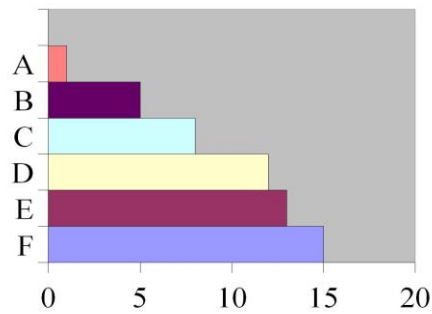
A)



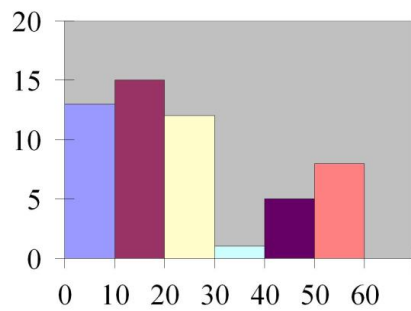
B)



C)



D)



Ans: D Difficulty: Easy Section: 2.2

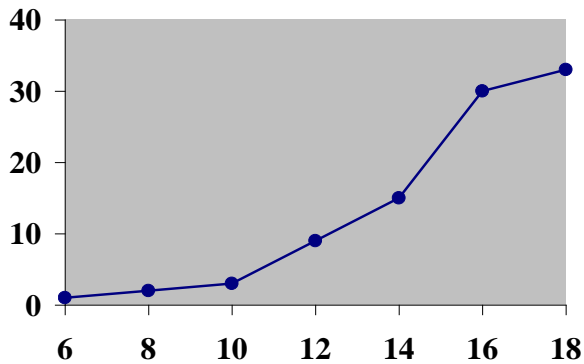
31. The frequency polygon and the histogram are two different ways to represent the same data set.

Ans: True Difficulty: Easy Section: 2.2

32. For a given data set, the ogive and the frequency polygon will have the same overall shape.

Ans: False Difficulty: Easy Section: 2.2

33. Using the ogive shown below, what is the cumulative frequency of data values less than or equal to 16 ?



A) 66 B) 60 C) 30 D) 20

Ans: C Difficulty: Difficult Section: 2.2

34. Graphs that show distributions using proportions instead of raw data as frequencies are called

A) relative frequency graphs. C) histograms.
B) ogive graphs. D) frequency polygons.

Ans: A Difficulty: Easy Section: 2.2

35. Which type of graph represents the data by using vertical bars of various heights to indicate frequencies?

A) ogive B) frequency polygon C) histogram D) cumulative frequency

Ans: C Difficulty: Easy Section: 2.2

36. The frequency polygon is a graph that displays the data by using lines that connect points plotted for the frequencies at the midpoints of the classes.

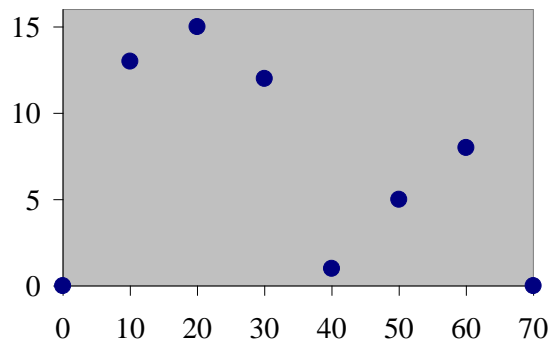
Ans: True Difficulty: Easy Section: 2.2

37. A histogram is a graph that represents the cumulative frequencies for the classes in a frequency distribution.

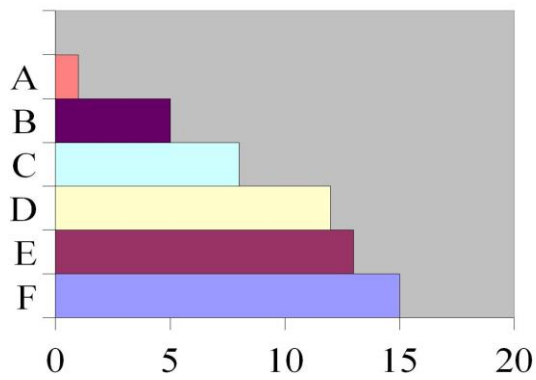
Ans: False Difficulty: Moderate Section: 2.2

38. Which of the following is a frequency polygon?

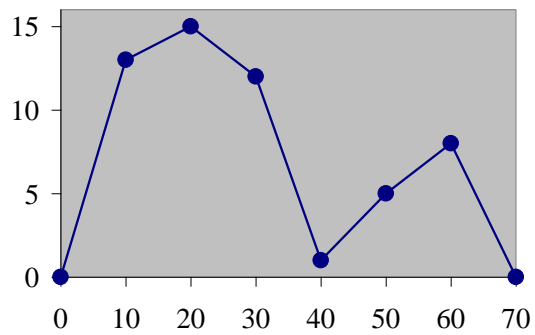
A)



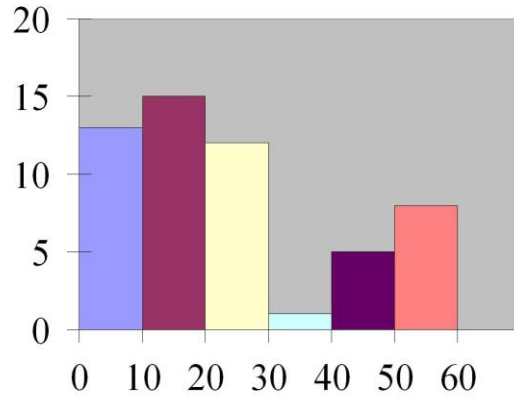
B)



C)

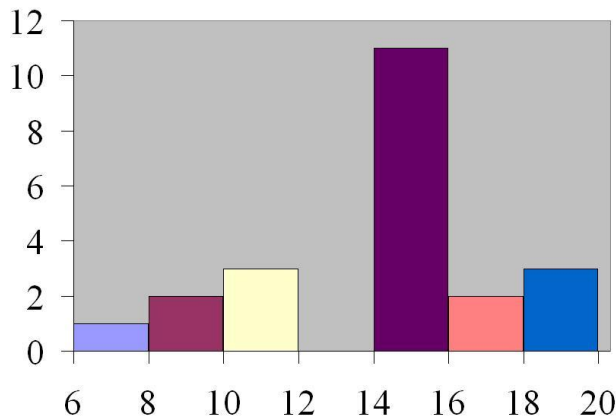


D)



Ans: C Difficulty: Moderate Section: 2.2

39. How many values are in the data set whose histogram is shown below ?



A) 6 B) 22 C) 76 D) 72

Ans: B Difficulty: Moderate Section: 2.2

40. Given the following frequency distribution, how many pieces of data were less than 28.5?

Class Boundaries	Frequencies
13.5–18.5	4
18.5–23.5	9
23.5–28.5	12
28.5–33.5	15
33.5–38.5	17

A) 12 B) 13 C) 25 D) 44

Ans: C Difficulty: Moderate Section: 2.2

41. If the graph of a frequency distribution has a peak and the data tapers off more slowly to the right and more quickly to the left, the distribution is said to be _____.

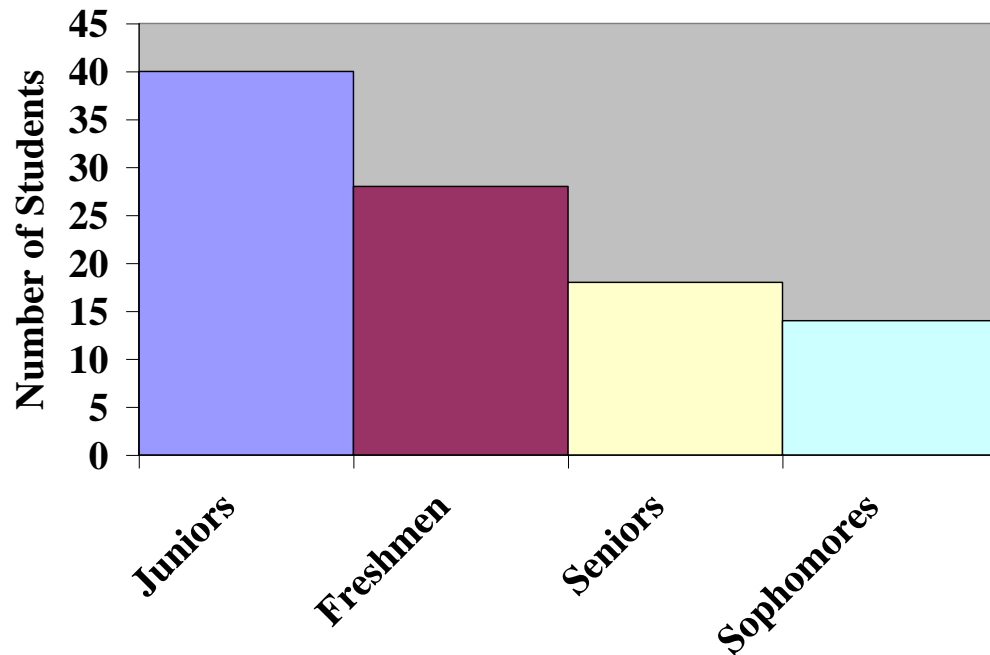
Ans: right-skewed

Difficulty: Moderate Section: 2.2

42. Construct a Pareto chart for the following distribution:

<u>Year in School</u>	<u>Number of Students</u>
Freshmen	28
Sophomores	14
Juniors	40
Seniors	18

Ans:

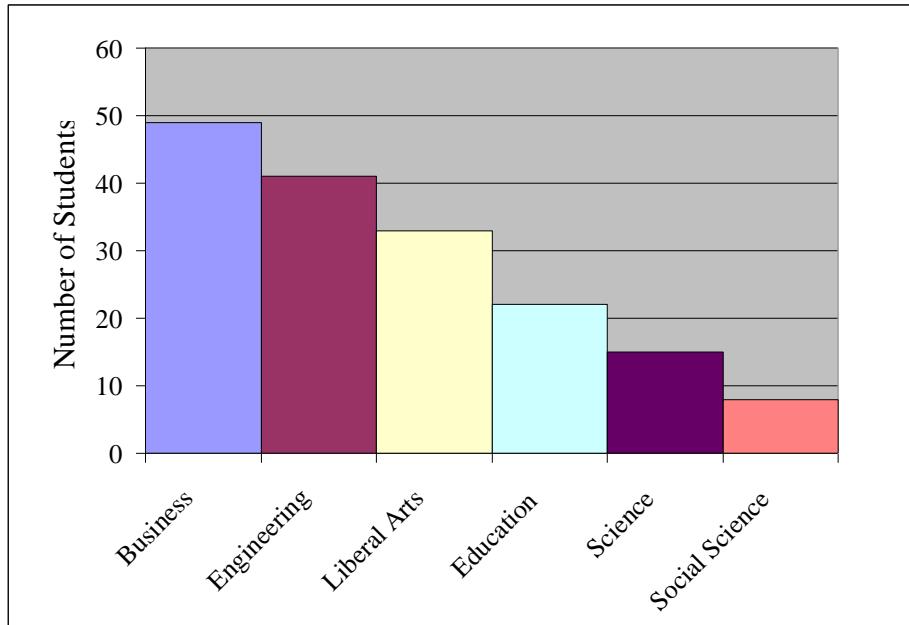


Difficulty: Moderate Section: 2.3

43. Construct a Pareto chart for the following distribution:

<u>Major</u>	<u>Number of Students</u>
Business	49
Science	15
Engineering	41
Social Sciences	8
Liberal Arts	33
Education	22

Ans:

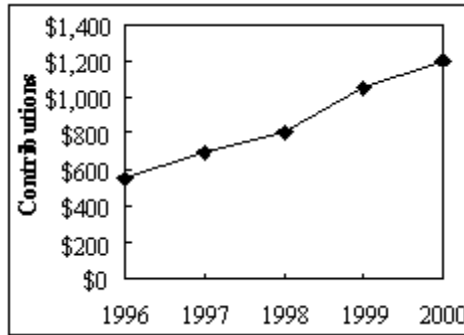


Difficulty: Moderate Section: 2.3

44. A local fundraiser wants to graphically display the contributions he has received over the past five years. Construct a time series graph for the following data.

<u>Year</u>	<u>Contributions</u>
1996	\$550
1997	\$700
1998	\$800
1999	\$1050
2000	\$1200

Ans:



Difficulty: Moderate Section: 2.3

45. An automobile dealer wants to construct a pie graph to represent types of cars sold in July. He sold 72 cars, 16 of which were convertibles. How many degrees should be used for the convertibles section ?

A) 60° B) 80° C) 100° D) 50°

Ans: B Difficulty: Moderate Section: 2.3

46. If a data set showing types of pizza ordered at a particular restaurant indicates 24 out of 72 orders were for pepperoni pizza, how many degrees would be needed to represent pepperoni pizza in a pie chart?

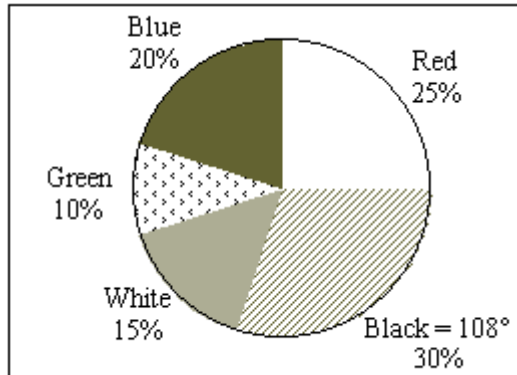
A) 90° B) 120° C) 60° D) 150°

Ans: B Difficulty: Easy Section: 2.3

47. The following information shows the colors of cars preferred by customers. Draw a pie graph and indicate how many degrees that black represents in a pie graph?

<u>Colors</u>	<u>Number</u>
Red	50
Black	60
White	30
Green	20
Blue	40

Ans:

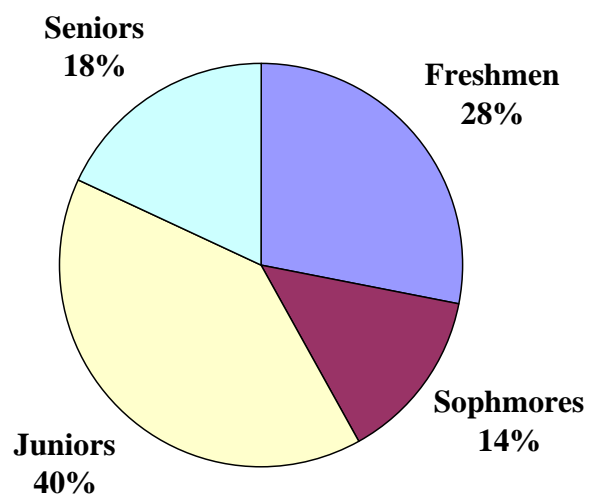


Difficulty: Moderate Section: 2.3

48. Construct a pie chart for the following distribution:

<u>Year in School</u>	<u>Number of Students</u>
Freshmen	28
Sophomores	14
Juniors	40
Seniors	18

Ans:

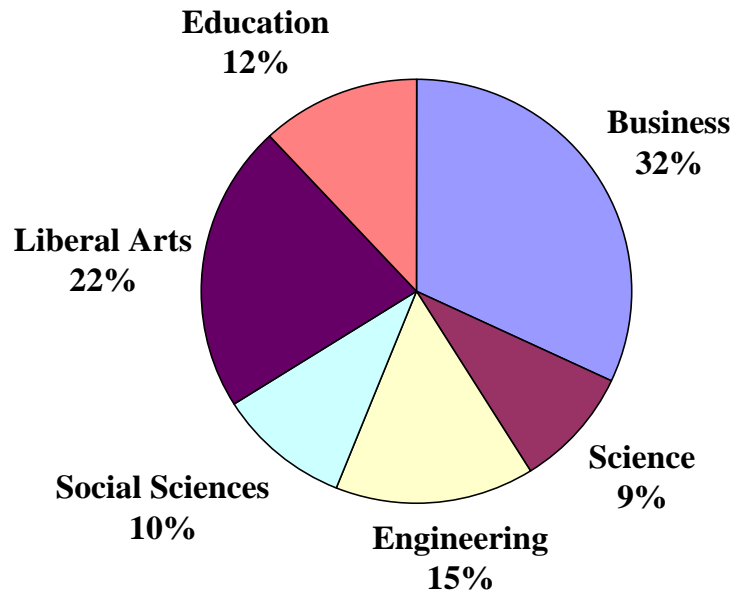


Difficulty: Moderate Section: 2.3

49. Construct a pie chart for the following distribution:

<u>Major</u>	<u>Number of Students</u>
Business	96
Science	27
Engineering	45
Social Sciences	30
Liberal Arts	36
Education	66

Ans:



Difficulty: Difficult Section: 2.3

50. Karen is constructing a pie graph to represent the number of hours her classmates do homework each day. She found that 8 of 24 classmates did homework for three hours each day. In her pie graph, this would represent how many degrees?

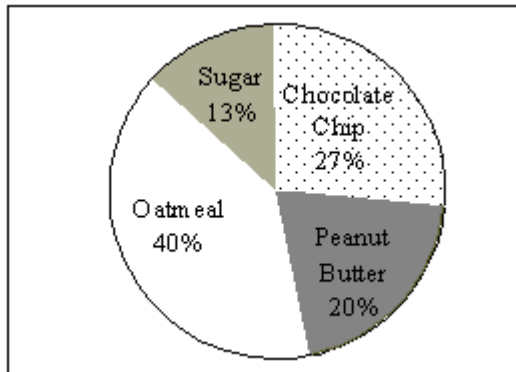
A) 135° B) 45° C) 120° D) 240°

Ans: C Difficulty: Moderate Section: 2.3

51. Construct a pie graph using the following data from a local bakery.

<u>Cookie Types</u>	<u>Number Sold</u>
Chocolate Chip	20
Peanut Butter	15
Oatmeal	30
Sugar	10

Ans:



Difficulty: Moderate Section: 2.3

52. A Pareto chart is useful for showing percentages of the total at different times.

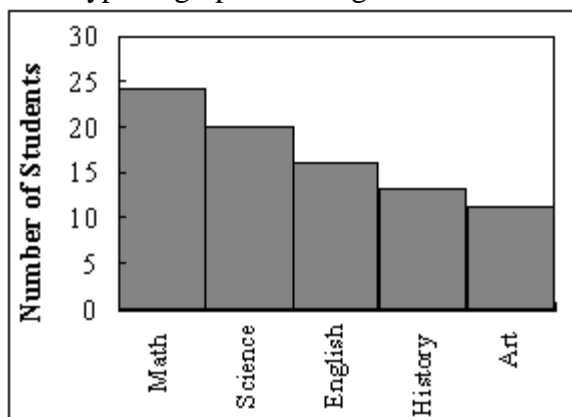
Ans: False Difficulty: Easy Section: 2.3

53. A weatherman records the amount of rain that fell in Portland, Oregon each day for a year. What type of graph should he use to show how rainfall changes during the year ?

A) pie graph B) pictograph C) time series graph D) Pareto chart

Ans: C Difficulty: Easy Section: 2.3

54. What type of graph is the figure below?



A) Pareto chart B) pictograph C) ogive D) pie graph

Ans: A Difficulty: Easy Section: 2.3

55. Graphs give a visual representation that may enable readers to analyze and interpret data more easily than simply looking at tables of numbers.

Ans: True Difficulty: Easy Section: 2.2

56. A time series graph represents data that occur over a specific time period.

Ans: True Difficulty: Easy Section: 2.3

57. A Pareto chart does not have which of the following properties?

- A) frequencies displayed by the heights of vertical bars
- B) frequencies arranged from highest to lowest
- C) quantitative variable on the horizontal axis
- D) classes of data are categorical

Ans: C Difficulty: Easy Section: 2.3

58. A pie graph is not useful in showing which of the following characteristics of a data set?

- A) frequency changes over time
- B) relative frequencies for each category in the distribution
- C) categories that make up the largest proportions of the total
- D) categories that make up the smallest proportions of the total

Ans: A Difficulty: Easy Section: 2.3

59. A time series graph is useful for which of the following purposes?

- A) representing relative frequencies of categories at a specific time
- B) representing the cumulative frequencies of the data at a specific time
- C) representing the frequencies of the data, sorted from largest to smallest
- D) representing the changing frequencies of a data category over a period time

Ans: D Difficulty: Easy Section: 2.3

60. A time series graph is useful for detecting trends that occur over the period of time.

Ans: True Difficulty: Easy Section: 2.3

61. When making Pareto charts, data should be arranged _____ according to frequency.

- A) from smallest to largest
- B) with increasing time
- C) from largest to smallest
- D) clockwise

Ans: C Difficulty: Moderate Section: 2.3

62. Which graph should be used to represent the frequencies with which certain courses are taken at Highlands Middle School?

- A) Pareto chart
- B) time series graph
- C) pie graph
- D) pictograph

Ans: A Difficulty: Moderate Section: 2.3

63. A Pareto chart arranges data from largest to smallest according to frequencies.

Ans: True Difficulty: Easy Section: 2.3

64. When two sets of data collected over specific periods of time are compared on the same graph using two lines, it is called a compound time series graph.

Ans: True Difficulty: Moderate Section: 2.3

65. A pie graph would best represent the number of inches of rain that has fallen in Ohio each day for the past 2 months.

Ans: False Difficulty: Moderate Section: 2.3

66. The percentages of white, wheat, and rye bread sold at a supermarket each week is best shown using a _____ graph.

Ans: pie

Difficulty: Moderate Section: 2.3

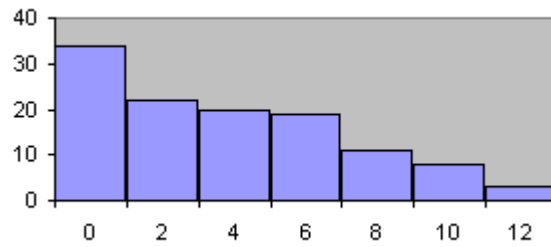
67. A _____ graph would most appropriately represent the number of students that were enrolled in Statistics for each of the past ten years.

Ans: time series

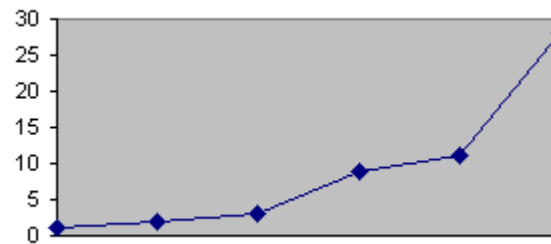
Difficulty: Moderate Section: 2.3

68. Which of the following is a Pareto chart?

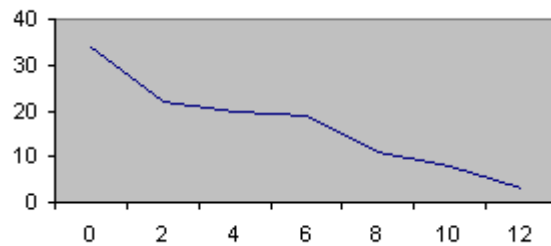
A)



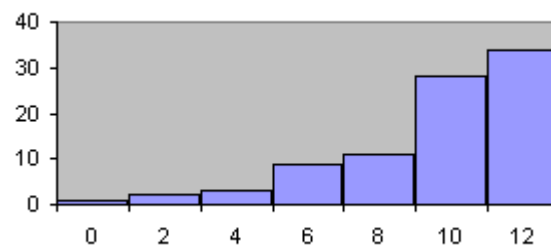
B)



C)



D)



Ans: A Difficulty: Easy Section: 2.3

69. A stem and leaf plot has the advantage over a grouped frequency distribution of retaining the actual data while still showing them in graphical form.

Ans: True Difficulty: Moderate Section: 2.3

70. Given the following two sets of data, draw a back-to-back stem and leaf plot.

A - 12, 22, 22, 24, 34, 31, 26, 35, 27, 39, 49, 10

B - 45, 36, 23, 16, 37, 28, 18, 13, 10, 23, 30, 31

Ans:

2, 0	1	0, 3, 6, 8
7, 6, 4, 2, 2	2	3, 3, 8
9, 5, 4, 1	3	0, 1, 6, 7
9	4	5

Difficulty: Moderate Section: 2.3