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
   B) 17.5 – 18.5 years old
   C) 17.6 – 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

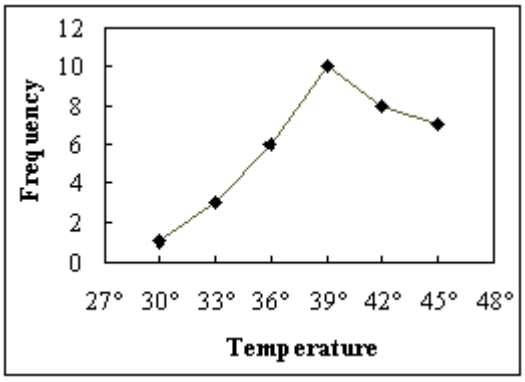
21. When the range is large, and classes that are several units in width are needed, a _____ frequency distribution is used.
Ans: grouped
Difficulty: Moderate Section: 2.1

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.

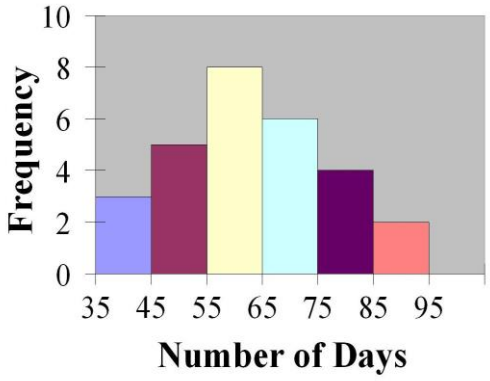
Temperature	**Frequency**
28.5–31.5	1
31.5–34.5	3
34.5–37.5	6
37.5–40.5	10
40.5–43.5	8
43.5–46.5	7

Ans:



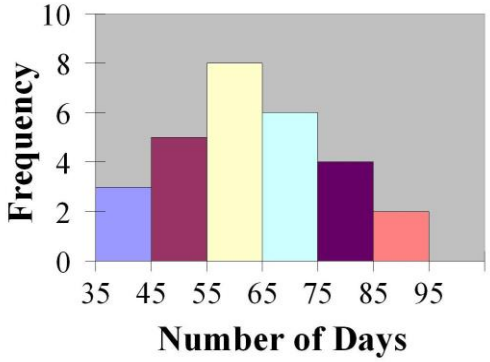
Difficulty: Moderate Section: 2.2

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.



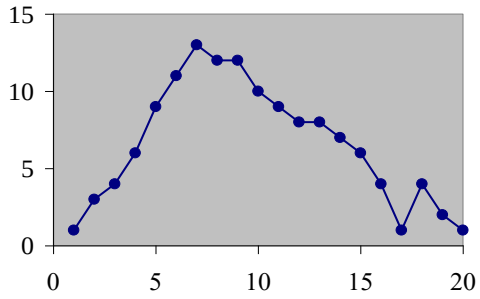
A) 55-65 B) 65-75 C) 75-85 D) 85-95
Ans: A Difficulty: Easy Section: 2.2

26. An ogive is also called a cumulative frequency graph.
Ans: True Difficulty: Easy Section: 2.2

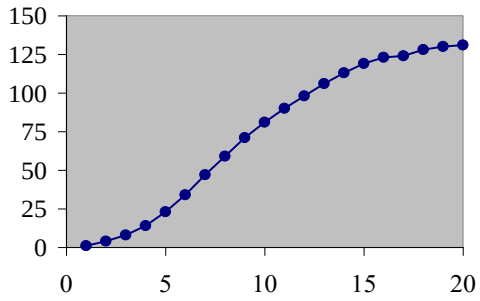
27. The three most commonly used graphs in research are the histogram, the _____, and the cumulative frequency graph (ogive).
Ans: frequency polygon
Difficulty: Easy Section: 2.2

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

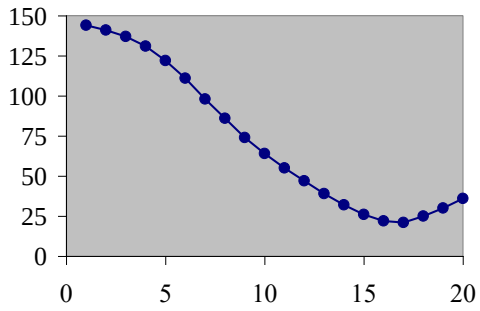
A)



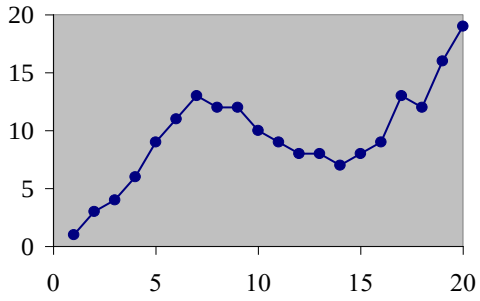
B)



C)



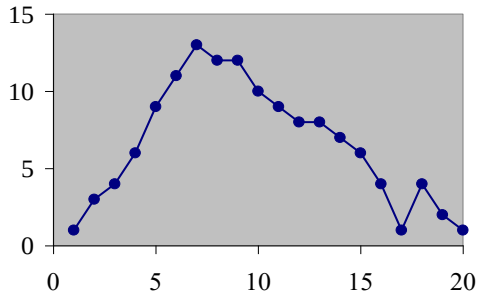
D)



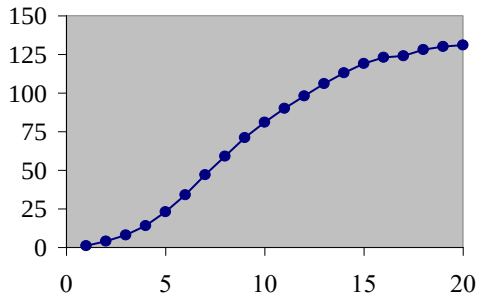
Ans: B Difficulty: Easy Section: 2.2

29. Which of the following could be an ogive?

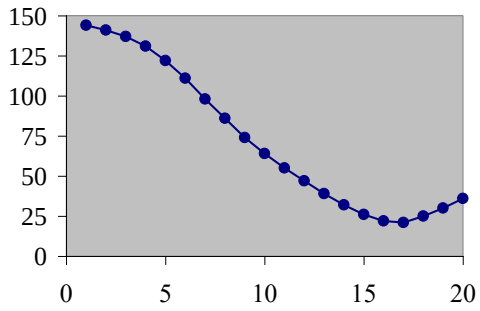
A)



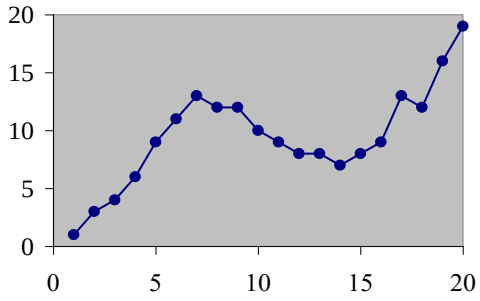
B)



C)



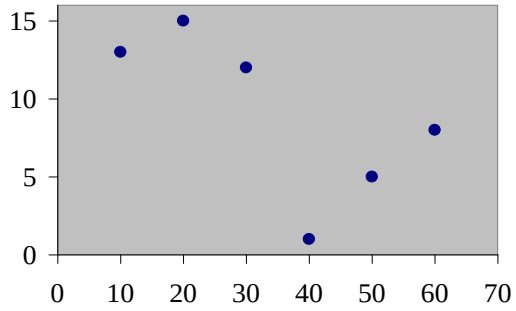
D)



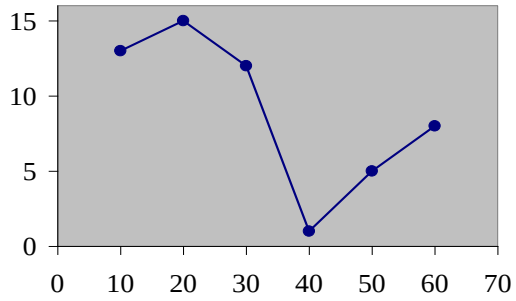
Ans: B Difficulty: Easy Section: 2.2

30. Which of the following is a histogram?

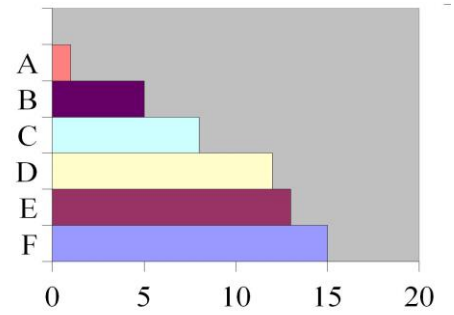
A)



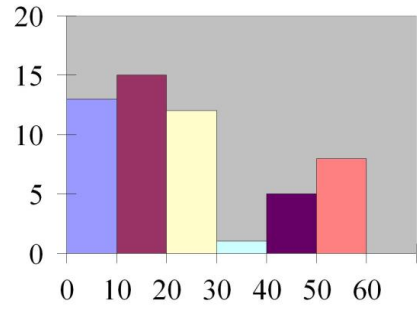
B)



C)



D)

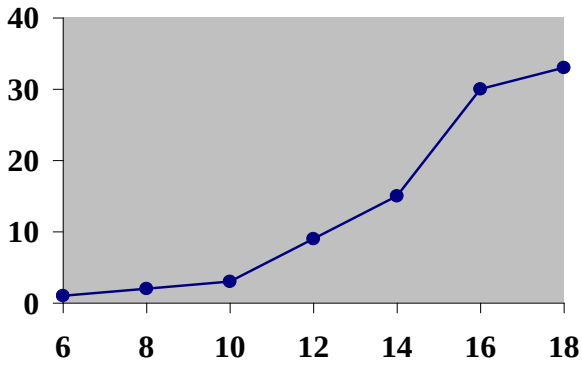


Ans: D Difficulty: Easy Section: 2.2

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

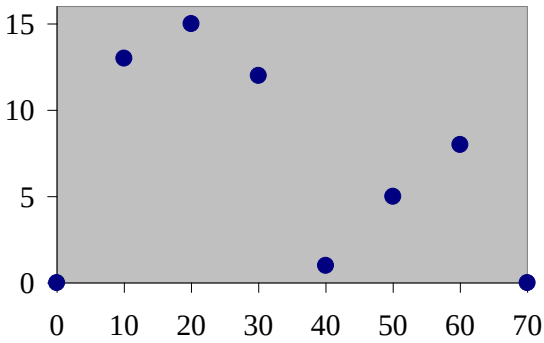
35. Which type of graph represents the data by using vertical bars of various heights to indicate frequencies?
A) ogive B) frequency polygon C) histogram D) cumulative frequency
Ans: C Difficulty: Easy Section: 2.2

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

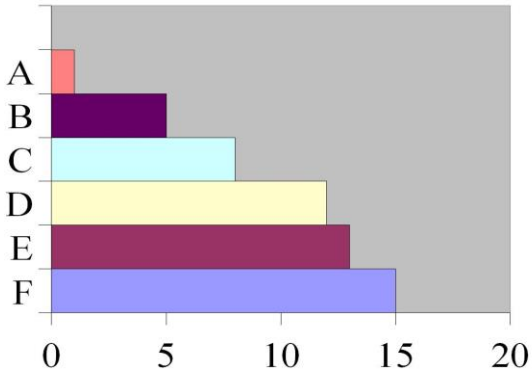
37. A histogram is a graph that represents the cumulative frequencies for the classes in a frequency distribution.
Ans: False Difficulty: Moderate Section: 2.2

38. Which of the following is a frequency polygon?

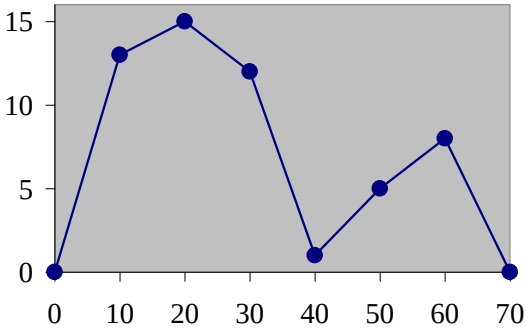
A)



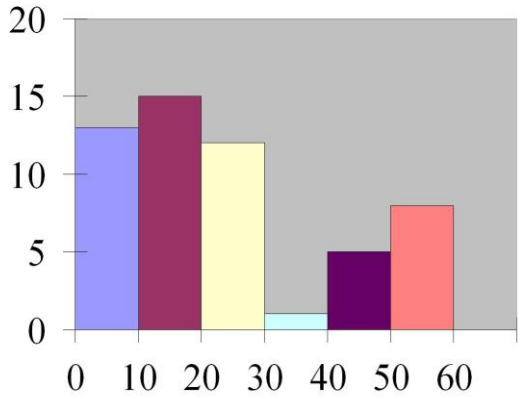
B)



C)

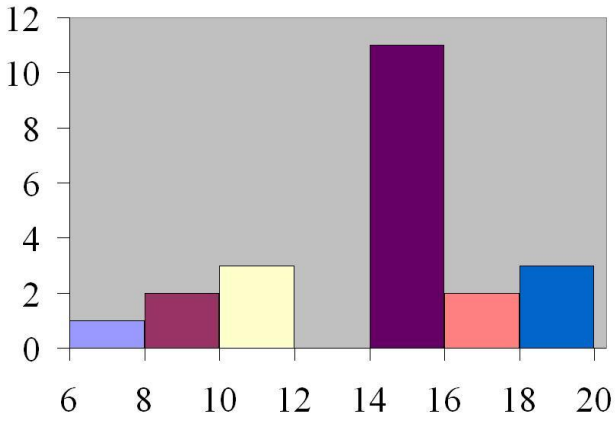


D)



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

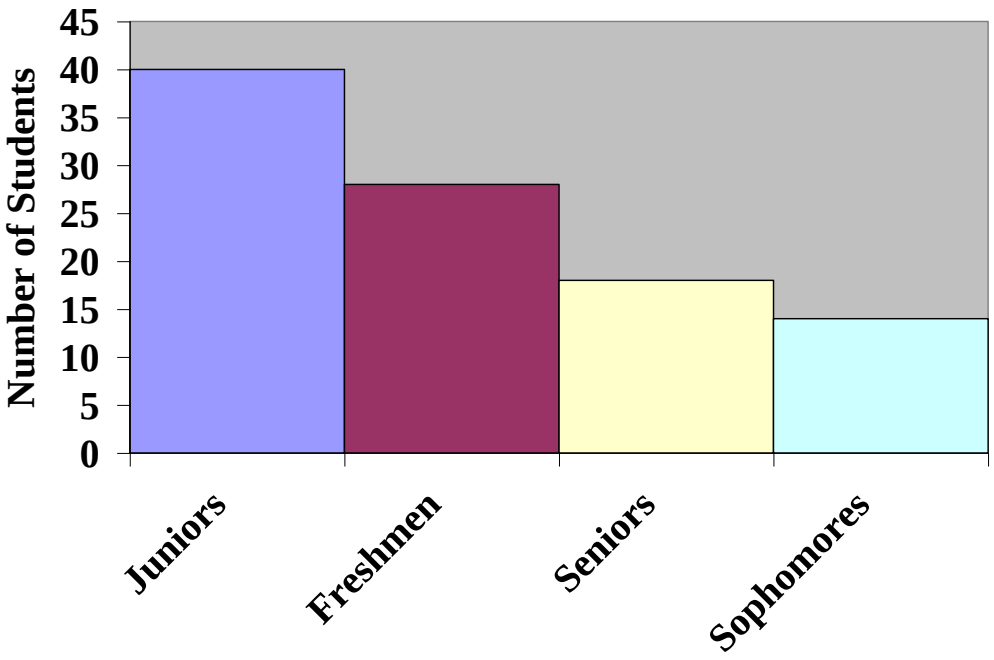
A) 12 B) 13 C) 25 D) 44
Ans: C Difficulty: Moderate Section: 2.2

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:

Year in School	Number of Students
Freshmen	28
Sophomores	14
Juniors	40
Seniors	18

Ans:

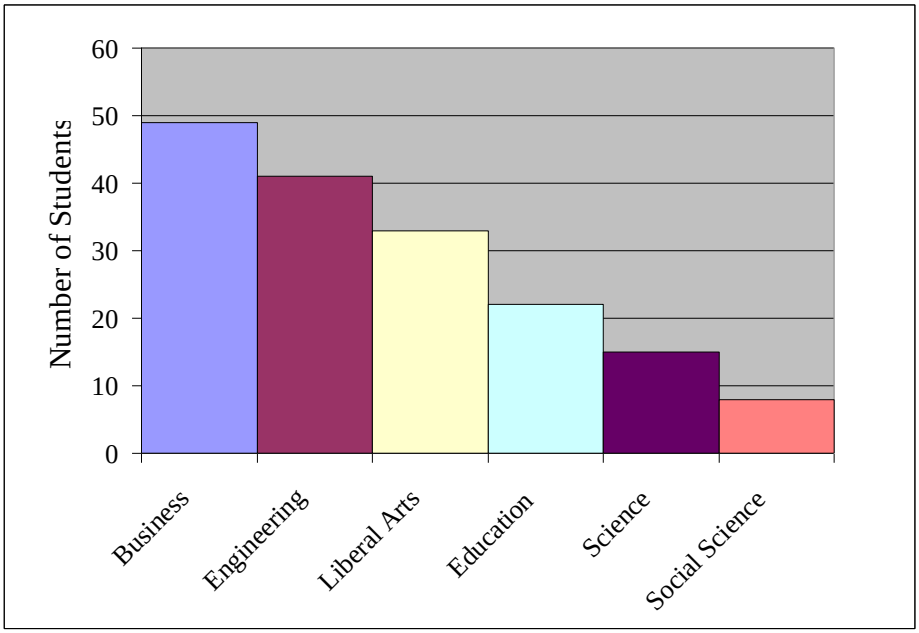


Difficulty: Moderate Section: 2.3

43. Construct a Pareto chart for the following distribution:

Major	**Number of Students**
Business	49
Science	15
Engineering	41
Social Sciences	8
Liberal Arts	33
Education	22

Ans:

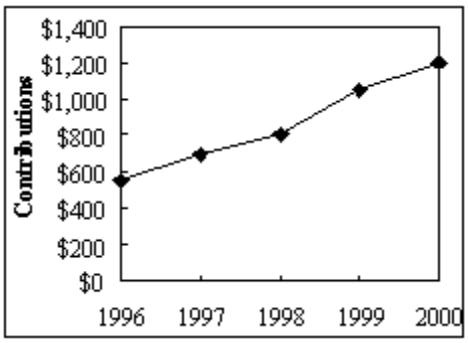


Difficulty: Moderate Section: 2.3

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.

Year	**Contributions**
1996	$550
1997	$700
1998	$800
1999	$1050
2000	$1200

Ans:



Difficulty: Moderate Section: 2.3

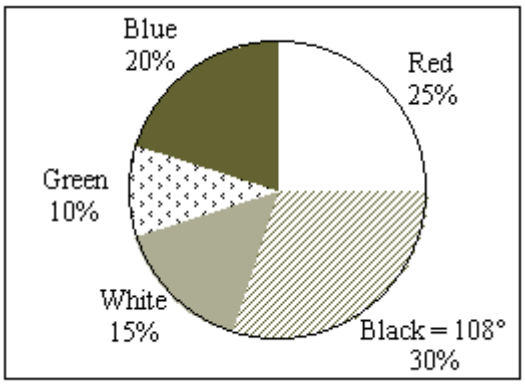
45. An automobile dealer wants to construct a pie graph to represent types of cars sold in July. He sold 72 cars, 16 of which were convertibles. How many degrees should be used for the convertibles section ?
A) 60° B) 80° C) 100° D) 50°
Ans: B Difficulty: Moderate Section: 2.3

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?

Colors	**Number**
Red	50
Black	60
White	30
Green	20
Blue	40

Ans:

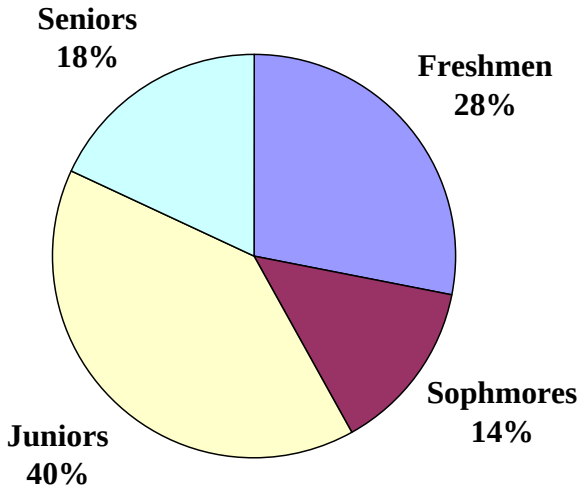


Difficulty: Moderate Section: 2.3

48. Construct a pie chart for the following distribution:

Year in School	Number of Students
Freshmen	28
Sophomores	14
Juniors	40
Seniors	18

Ans:

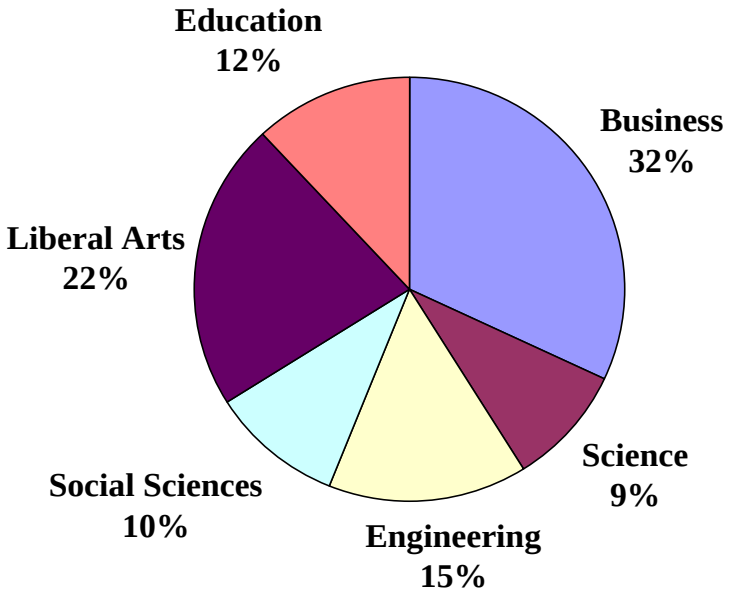


Difficulty: Moderate Section: 2.3

49. Construct a pie chart for the following distribution:

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

Ans:



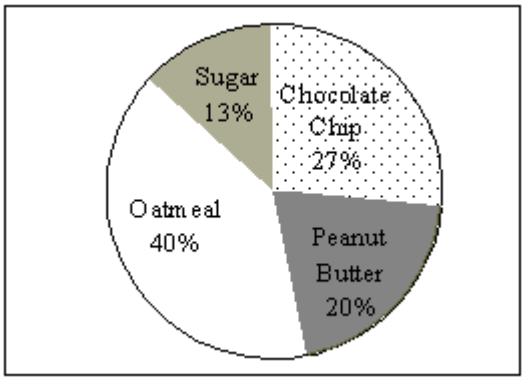
Difficulty: Difficult Section: 2.3

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.

Cookie Types	**Number Sold**
Chocolate Chip	20
Peanut Butter	15
Oatmeal	30
Sugar	10

Ans:

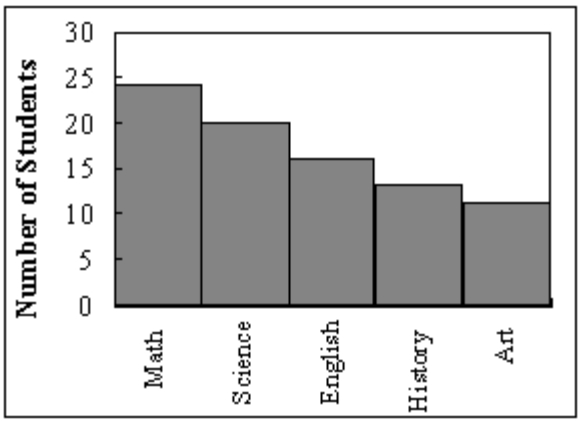


Difficulty: Moderate Section: 2.3

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

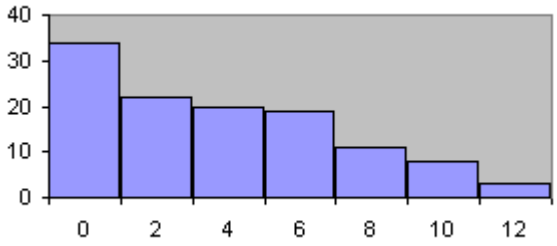
65. A pie graph would best represent the number of inches of rain that has fallen in Ohio each day for the past 2 months.
Ans: False Difficulty: Moderate Section: 2.3

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)



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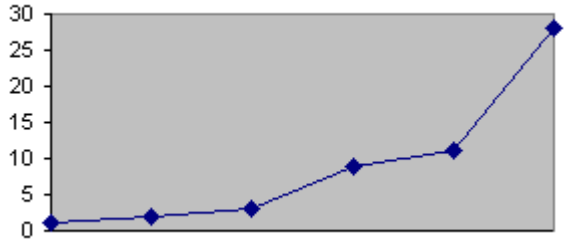
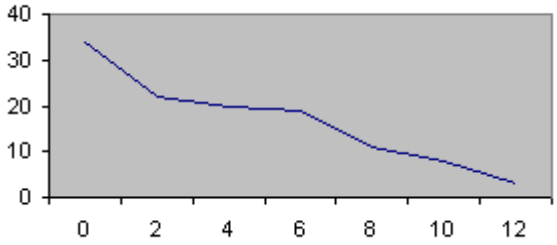
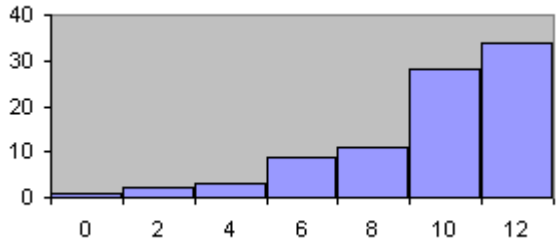


C)



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