# Test Bank for Elementary Statistics 8th Edition by Bluman

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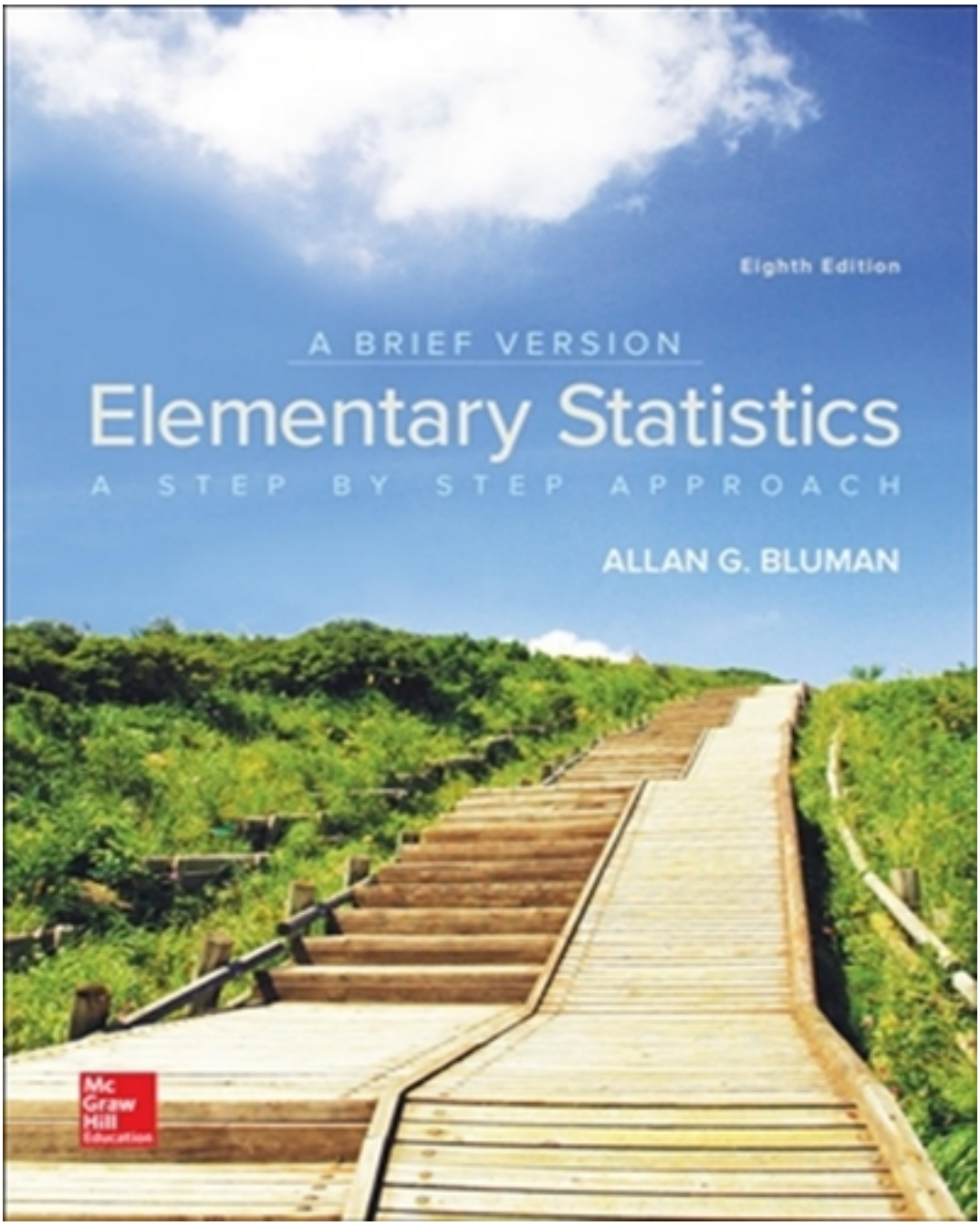



# Test Bank

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

Which of the following does not need to be done when constructing a frequency distribution?
A) use classes that are mutually exclusive
B) select the number of classes desired
C) find the range
D) make the class width an even number
Answer: D

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) grouped
B) categorical
C) cumulative
D) ungrouped
Answer: B

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
B) categorical frequency distribution
C) grouped frequency distribution
D) upper boundary
Answer: B

When the range is large, and classes that are several units in width are needed, a _____ frequency distribution is used.
A) grouped
B) cumulative
C) ungrouped
D) upper-ended
Answer: A

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.
A) False
B) True
Answer: B

A recent statistics exam yielded the following 25 scores. Construct a grouped frequency distribution with the class limits shown below.

64 84 71 59 67
58 88 68 70 94
90 81 43 77 86
72 81 79 98 52
72 72 47 81 96

| Class Limits | Tally | Frequency |
|---|---|---|
| 41-50 | | |
| 51-60 | | |
| 61-70 | | |
| 71-80 | | |
| 81-90 | | |
| 91-100 | | |

A)

| Class Limits | Frequency |
|---|---|
| 41-50 | 2 |
| 51-60 | 2 |
| 61-70 | 5 |
| 71-80 | 6 |
| 81-90 | 7 |
| 91-100 | 3 |

B)

| Class Limits | Frequency |
|---|---|
| 41-50 | 3 |
| 51-60 | 2 |
| 61-70 | 4 |
| 71-80 | 7 |
| 81-90 | 6 |
| 91-100 | 3 |

C)

| Class Limits | Frequency |
|---|---|
| 41-50 | 2 |
| 51-60 | 3 |
| 61-70 | 5 |
| 71-80 | 5 |
| 81-90 | 6 |
| 91-100 | 4 |

D)

| Class Limits | Frequency |
|---|---|
| 41-50 | 2 |
| 51-60 | 3 |
| 61-70 | 4 |
| 71-80 | 6 |
| 81-90 | 7 |
| 91-100 | 3 |

Answer: D

The following frequency distribution presents the frequency of passenger vehicles that pass through a certain intersection from 8:00 AM to 9:00 AM on a particular day.

| Vehicle Type | Frequency |
|---|---|
| Motorcycle | 9 |
| Sedan | 66 |
| SUV | 79 |
| Truck | 45 |

What is the relative frequency of the Motorcyle category?

A) 9

B) 0.045

C) 0.114

D) 9%

Answer: B

The following frequency distribution presents the frequency of passenger vehicles that pass through a certain intersection from 8:00 AM to 9:00 AM on a particular day.

| Vehicle Type | Frequency |
|---|---|
| Motorcycle | 11 |
| Sedan | 71 |
| SUV | 73 |
| Truck | 45 |

Construct a relative frequency distribution for the data.

A)

| Vehicle Type | Relative Frequency |
|---|---|
| Motorcycle | 0.11 |
| Sedan | 0.71 |
| SUV | 0.73 |
| Truck | 0.45 |

B)

| Vehicle Type | Relative Frequency |
|---|---|
| Motorcycle | 0.055 |
| Sedan | 0.355 |
| SUV | 0.365 |
| Truck | 0.225 |

C)

| Vehicle Type | Relative Frequency |
|---|---|
| Motorcycle | 0.151 |
| Sedan | 0.973 |
| SUV | 1 |
| Truck | 0.616 |

D)

| Vehicle Type | Relative Frequency |
|---|---|
| Motorcycle | 0.055% |
| Sedan | 0.355% |
| SUV | 0.365% |
| Truck | 0.225% |

Answer: B

A survey was taken on how much trust people place in the information they read on the Internet. Construct a categorical frequency distribution for the data. A trust in all that they read, M trust in most of what they read, H trust in about one-half of what they read, S trust in a small portion of what they read.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| M | M | H | M | M | M | M | M | A | M |
| H | M | M | M | M | M | S | A | H | M |
| M | H | M | M | M | M | M | M | M | M |
| M | M | M | M | S | M | M | M | M | M |

A)

| Class | Frequency |
|---|---|
| A | 2 |
| M | 32 |
| H | 4 |
| S | 2 |

B)

| Class | Freq | Percent |
|---|---|---|
| A | 2 | 5% |
| M | 30 | 75% |
| H | 6 | 15% |
| S | 2 | 5% |
| | 40 | 100% |

C)

| Class | Frequency |
|---|---|
| A | 2 |
| M | 30 |
| H | 6 |
| S | 2 |

D)

| Class | Freq | Percent |
|---|---|---|
| A | 2 | 5% |
| M | 32 | 80% |
| H | 4 | 10% |
| S | 2 | 5% |
| | 40 | 100% |

Answer: D

The following table presents the purchase totals (in dollars) of a random sample of gasoline purchases at a convenience store.

Construct a frequency distribution using a class width of 10, and using 0 as the lower class limit for the first class.

| | | | | |
|---|---|---|---|---|
| 42.46 | 93.02 | 43.70 | 34.08 | 84.53 |
| 61.99 | 60.75 | 95.40 | 24.97 | 83.91 |
| 39.81 | 92.43 | 34.08 | 48.35 | 26.54 |
| 31.95 | 7.26 | 74.37 | 76.85 | 60.62 |

A)

| Convenience Store Gas Purchases | |
|---|---|
| Amount (dollars) | Frequency |
| 0.00-9.99 | 1 |
| 10.00-19.99 | 0 |
| 20.00-29.99 | 2 |
| 30.00-39.99 | 4 |
| 40.00-49.99 | 2 |
| 50.00-59.99 | 1 |
| 60.00-69.99 | 3 |
| 70.00-79.99 | 2 |
| 80.00-89.99 | 2 |
| 90.00-99.99 | 3 |

B)

| Convenience Store Gas Purchases | |
|---|---|
| Amount (dollars) | Frequency |
| 0.00-9.99 | 1 |
| 10.00-19.99 | 0 |
| 20.00-29.99 | 2 |
| 30.00-39.99 | 4 |
| 40.00-49.99 | 3 |
| 50.00-59.99 | 0 |
| 60.00-69.99 | 4 |
| 70.00-79.99 | 1 |
| 80.00-89.99 | 2 |
| 90.00-99.99 | 3 |

C)

| Convenience Store Gas Purchases | |
|---|---|
| Amount (dollars) | Frequency |
| 0.00-9.99 | 1 |
| 10.00-19.99 | 0 |
| 20.00-29.99 | 2 |
| 30.00-39.99 | 4 |
| 40.00-49.99 | 3 |
| 50.00-59.99 | 0 |
| 60.00-69.99 | 3 |
| 70.00-79.99 | 2 |
| 80.00-89.99 | 2 |
| 90.00-99.99 | 3 |

D)

| Convenience Store Gas Purchases | |
|---|---|
| Amount (dollars) | Frequency |
| 0.00-9.99 | 1 |
| 10.00-19.99 | 0 |
| 20.00-29.99 | 1 |
| 30.00-39.99 | 5 |
| 40.00-49.99 | 3 |
| 50.00-59.99 | 0 |
| 60.00-69.99 | 3 |
| 70.00-79.99 | 2 |
| 80.00-89.99 | 2 |
| 90.00-99.99 | 3 |

Answer: C

The following table presents the purchase totals (in dollars) of a random sample of gasoline purchases at a convenience store.

Construct a relative frequency distribution using a class width of 10, and using 0 as the lower class limit for the first class.

| | | | | |
|---|---|---|---|---|
| 57.46 | 27.21 | 6.12 | 97.99 | 68.22 |
| 28.97 | 39.41 | 77.56 | 37.06 | 73.09 |
| 88.82 | 61.29 | 93.24 | 65.96 | 42.37 |
| 94.38 | 7.67 | 16.95 | 71.17 | 65.37 |

A)

| Convenience Store Gas Purchases | |
|---|---|
| Amount (dollars) | Relative Frequency |
| 0.00-9.99 | 0.100 |
| 10.00-19.99 | 0.050 |
| 20.00-29.99 | 0.100 |
| 30.00-39.99 | 0.080 |
| 40.00-49.99 | 0.070 |
| 50.00-59.99 | 0.050 |
| 60.00-69.99 | 0.200 |
| 70.00-79.99 | 0.150 |
| 80.00-89.99 | 0.050 |
| 90.00-99.99 | 0.150 |

B)

| Convenience Store Gas Purchases | |
|---|---|
| Amount (dollars) | Relative Frequency |
| 0.00-9.99 | 0.100 |
| 10.00-19.99 | 0.050 |
| 20.00-29.99 | 0.100 |
| 30.00-39.99 | 0.100 |
| 40.00-49.99 | 0.030 |
| 50.00-59.99 | 0.070 |
| 60.00-69.99 | 0.200 |
| 70.00-79.99 | 0.150 |
| 80.00-89.99 | 0.050 |
| 90.00-99.99 | 0.150 |

C)

| Convenience Store Gas Purchases | |
|---|---|
| Amount (dollars) | Relative Frequency |
| 0.00-9.99 | 0.100 |
| 10.00-19.99 | 0.050 |
| 20.00-29.99 | 0.100 |
| 30.00-39.99 | 0.100 |
| 40.00-49.99 | 0.050 |
| 50.00-59.99 | 0.050 |
| 60.00-69.99 | 0.200 |
| 70.00-79.99 | 0.150 |
| 80.00-89.99 | 0.050 |
| 90.00-99.99 | 0.150 |

D)

| Convenience Store Gas Purchases | |
|---|---|
| Amount (dollars) | Relative Frequency |
| 0.00-9.99 | 0.100 |
| 10.00-19.99 | 0.050 |
| 20.00-29.99 | 0.100 |
| 30.00-39.99 | 0.100 |
| 40.00-49.99 | 0.050 |
| 50.00-59.99 | 0.040 |
| 60.00-69.99 | 0.210 |
| 70.00-79.99 | 0.150 |
| 80.00-89.99 | 0.050 |
| 90.00-99.99 | 0.150 |

Answer: C

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

A) True

B) False

Answer: A

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

A) distribution
B) frequency
C) size
D) width

Answer: B

How many classes should frequency distributions have?

A) 5-20
B) 10-20
C) 1-5
D) 5-10

Answer: A

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

A) 7.5
B) 15
C) 16
D) 14

Answer: B

The following frequency distribution presents the weights in pounds (lb) of a sample of visitors to a health clinic.

| Weight (lb) | Frequency |
|---|---|
| 90-101 | 3 |
| 102-113 | 5 |
| 114-125 | 5 |
| 126-137 | 5 |
| 138-149 | 6 |
| 150-161 | 8 |
| 162-173 | 5 |
| 174-185 | 1 |

What is the class width?

A) 13
B) 12
C) 96
D) 11

Answer: B

For the class 9-19, the class boundaries are

A) 8 and 20
B) 9 and 19
C) 8.5 and 19.5
D) 9.5 and 18.5

Answer: C

What are the boundaries of the class 11-18?

A) 11 and 18
B) 10.5 and 18.5
C) 7.5 and 21.5
D) 7

Answer: B

Find the class boundaries, midpoint, and width of the class 33-40?

A) boundaries: 33-40; midpoint: 36.5; width: 7
B) boundaries: 33.5-39.5; midpoint: 36.5; width: 6
C) boundaries: 32.5-40.5; midpoint: 36.5; width: 7
D) boundaries: 32.5-40.5; midpoint: 36.5; width: 8

Answer: D

Find the class boundaries, midpoint, and width of the class 17.4-19.2?

A) boundaries: 17.35-19.25; midpoint: 18.3; width: 1.9
B) boundaries: 17.4-19.2; midpoint: 18.3; width: 1.9
C) boundaries: 17.35-19.25; midpoint: 18.3; width: 0.95
D) boundaries: 15.5-19.25; midpoint: 17.4; width: 3.8

Answer: A

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

Answer: A

What is the midpoint of the class 10-14?

A) 5
B) 12.5
C) 4
D) 12

Answer: D

What are the boundaries of of the class 13–17?

A) 12.5-17.5
B) 13.5-16.5
C) 13-17
D) 13.5-17.5

Answer: A

What is the midpoint of the class 13–16?

A) 3
B) 14.5
C) 1.5
D) 14

Answer: B

What is the upper class boundary of the class 23-35 ?

A) 7
B) 7.5
C) 35
D) 35.5

Answer: D

If the limits for a class were 20-38, the boundaries would be 19.5-38.5.

A) False
B) True

Answer: B

For grouped frequency distributions, the _____ is obtained by adding the lower and upper limits and dividing by 2.

A) width
B) range
C) class midpoint
D) upper boundary

Answer: C

What are the class boundaries of the class 6-10?

A) 5.5-10.5
B) 6.5-9.5
C) 6-10
D) 5.5-9.5

Answer: A

What are the boundaries of the class 1.87-3.43?

A) 1.865-3.435
B) 1.82-3.48
C) 1.87-3.43
D) 1.879-3.439

Answer: A

For the class 16.3-23.8, the width is 8.5.

A) False
B) True

Answer: A

State the reason why the following frequency distribution is incorrectly constructed.

| Class | Frequency |
|---|---|
| 36-41 | 1 |
| 42-47 | 0 |
| 48-54 | 6 |
| 55-60 | 3 |
| 61-66 | 3 |

A) class width is not uniform
B) there is no percent column
C) a class has been omitted
D) class limits overlap

Answer: A

State the reason why the following frequency distribution is incorrectly constructed.

| Class | Frequency |
|---|---|
| 37-44 | 2 |
| 44-51 | 2 |
| 51-58 | 4 |
| 58-65 | 6 |
| 65-72 | 1 |

A) class limits overlap
B) there is no percent column
C) class width is not uniform
D) a class has been omitted

Answer: A

State the reason why the following frequency distribution is incorrectly constructed.

| Class | Frequency |
|---|---|
| 124-132 | 3 |
| 133-141 | 6 |
| 151-159 | 11 |
| 160-168 | 12 |

A) class limits overlap
B) class width is not uniform
C) a class has been omitted
D) there is no percent column

Answer: C

State the reason why the following frequency distribution is incorrectly constructed.

| Class | Frequency |
|---|---|
| 26-34 | 2 |
| 35-43 | 0 |
| 44-52 | 4 |
| 53-63 | 4 |
| 64-72 | 1 |

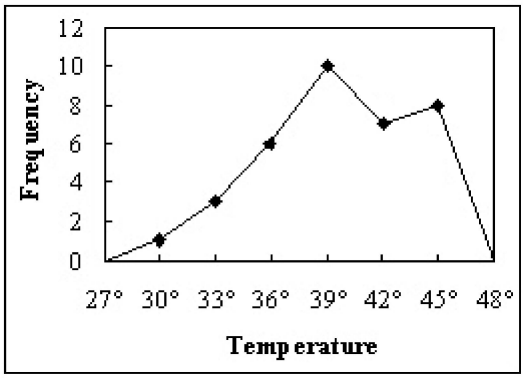
A) a class has been omitted
B) class width is not uniform
C) class limits overlap
D) there is no percent column

Answer: B

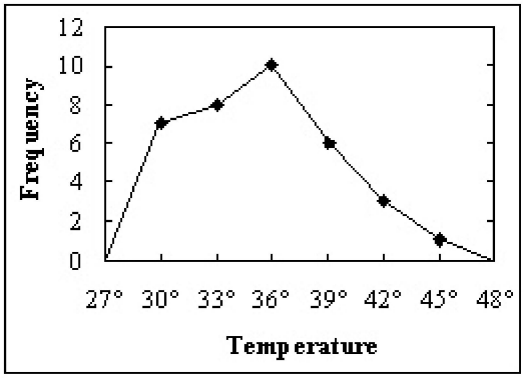
Construct a frequency polygon from the following frequency distribution.

| 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 |

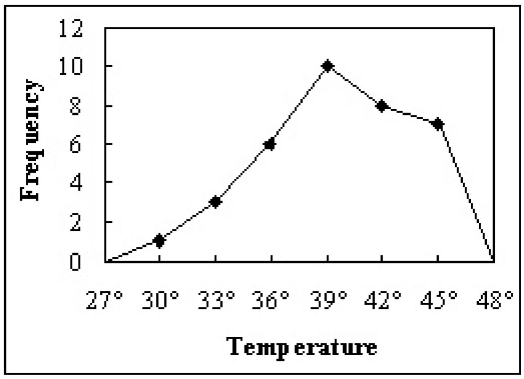
A)



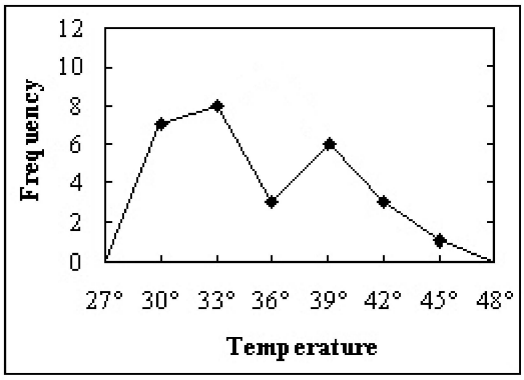
B)




C)




D)



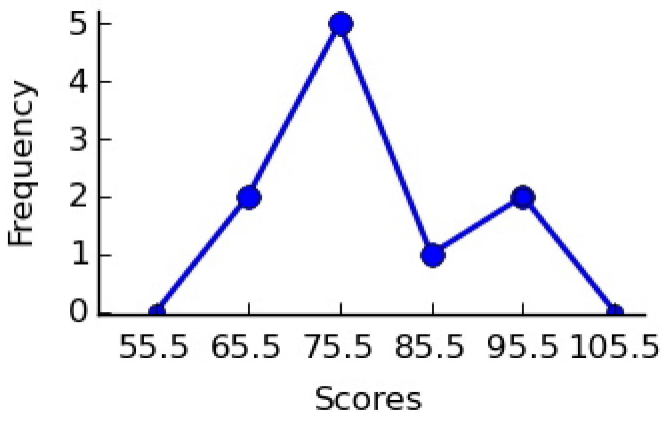

Answer: C

A recent statistics exam yielded the following 10 scores. Construct a frequency polygon distribution using the class limits shown below.

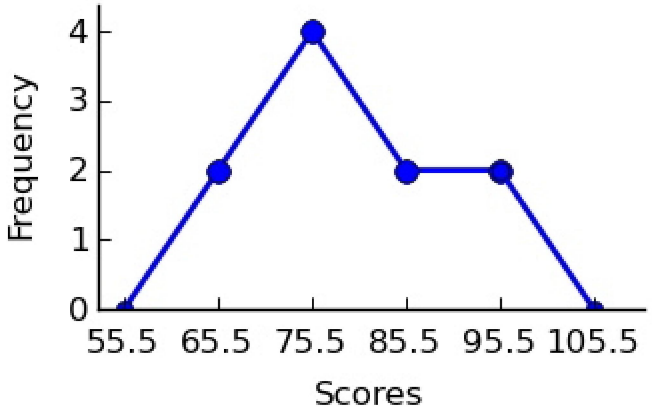
80, 99, 77, 67, 93, 71, 76, 86, 79, 71

| Class Limits | Midpoints | Tally | Frequency |
|---|---|---|---|
| 61-70 | | | |
| 71-80 | | | |
| 81-90 | | | |
| 91-100 | | | |

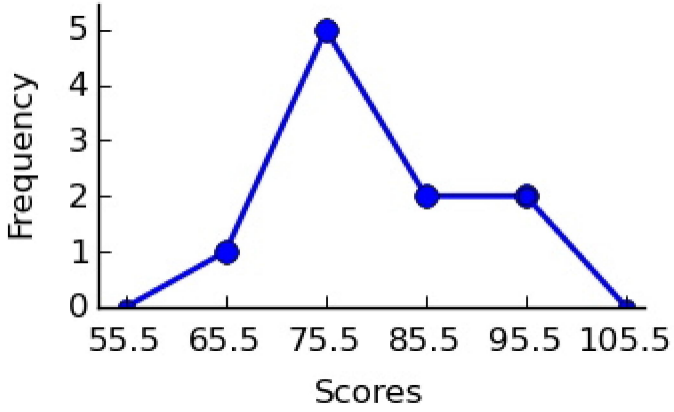
A)



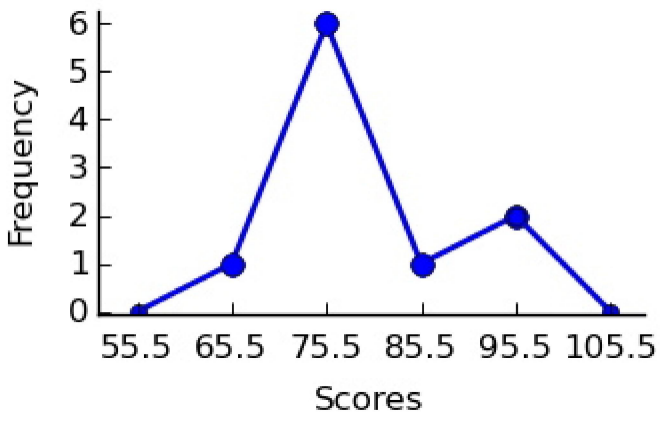

B)




C)



D)




Answer: D

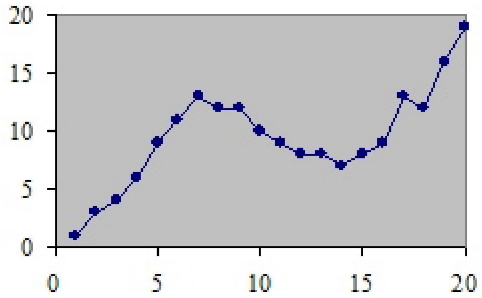
The three most commonly used graphs in research are the histogram, the _____, and the cumulative frequency graph (ogive).

A) bar chart
B) Pareto chart
C) time series
D) frequency polygon

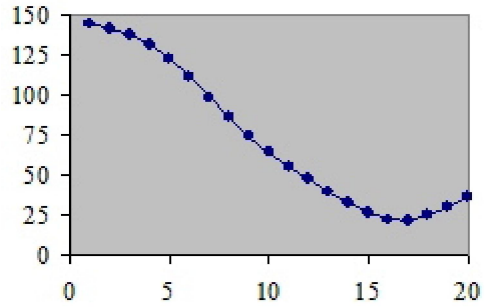
Answer: D

Which of the following could be a cumulative frequency graph?

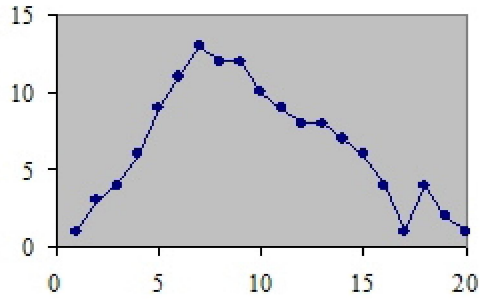
A)



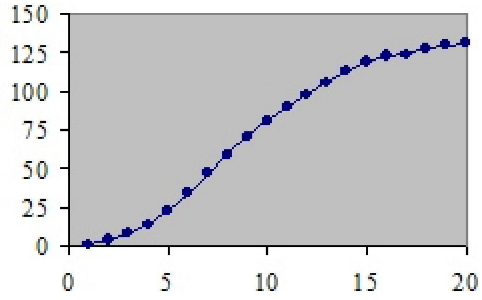

B)



C)




D)




Answer: D

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.

A) False

B) True

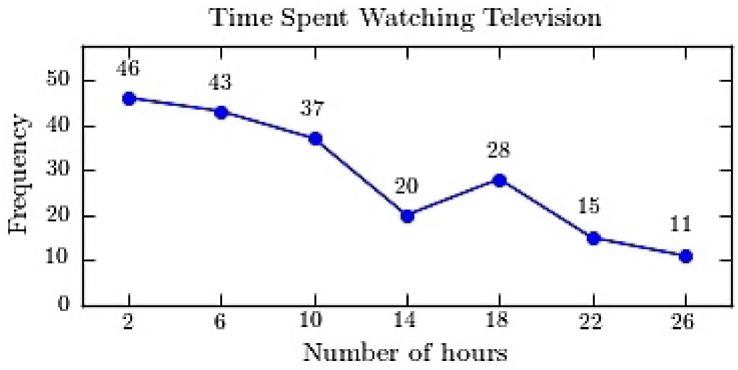
Answer: B

A sample of 200 high school students were asked how many hours per week they spend watching television.The following frequency distribution presents the results.

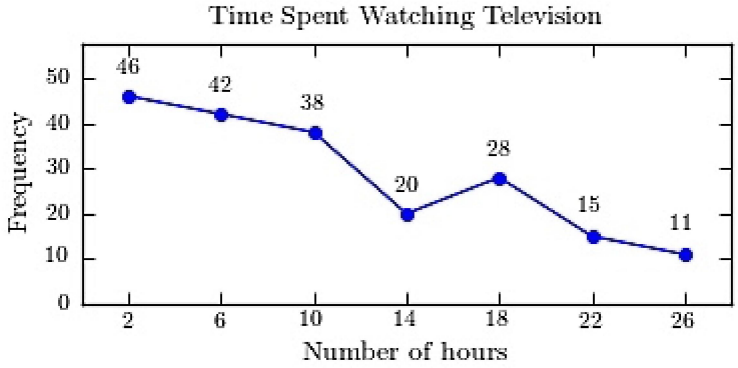
| Time Spent Watching Television | |
|---|---|
| Number of hours | Frequency |
| 0.0-3.9 | 46 |
| 4.0-7.9 | 43 |
| 8.0-11.9 | 37 |
| 12.0-15.9 | 20 |
| 16.0-19.9 | 28 |
| 20.0-23.9 | 15 |
| 24.0-27.9 | 11 |

Construct a frequency polygon for the frequency distribution.

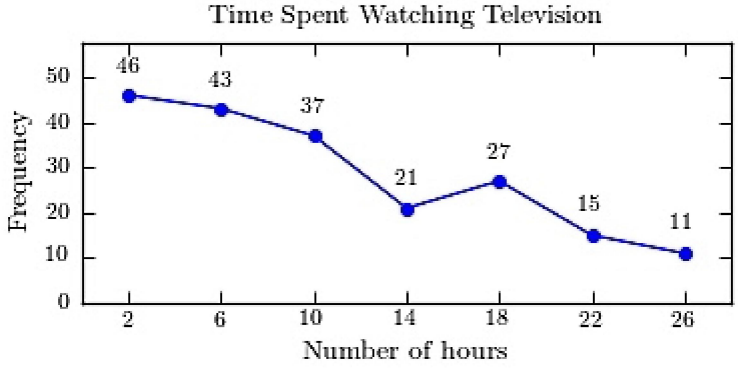
A)



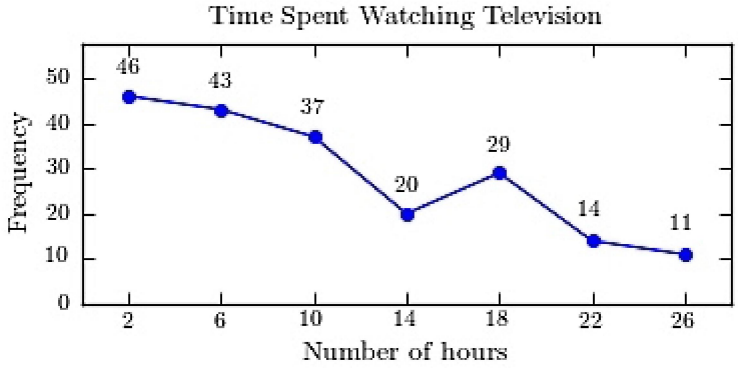

B)




C)




D)



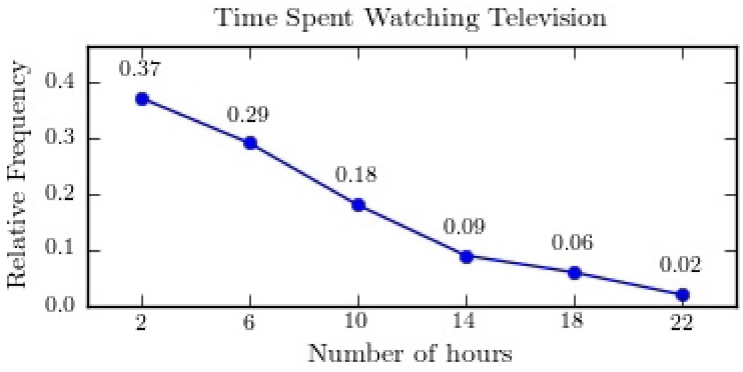
Answer: A

A sample of 200 high school students were asked how many hours per week they spend watching television.The following frequency distribution presents the results.

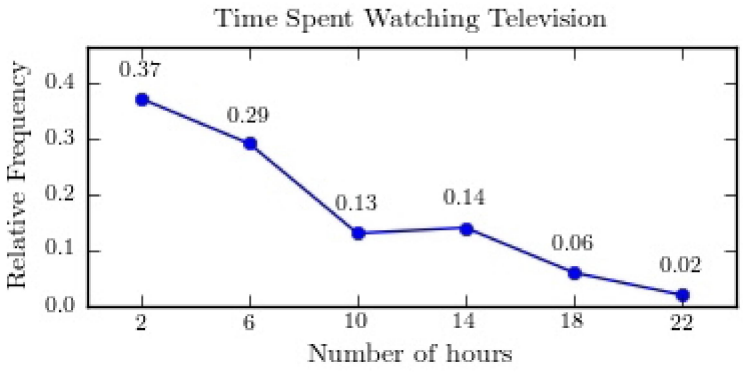
| Time Spent Watching Television | |
|---|---|
| Number of hours | Frequency |
| 0.0-3.9 | 74 |
| 4.0-7.9 | 57 |
| 8.0-11.9 | 35 |
| 12.0-15.9 | 18 |
| 16.0-19.9 | 12 |
| 20.0-23.9 | 4 |

Construct a relative frequency polygon for the frequency distribution.

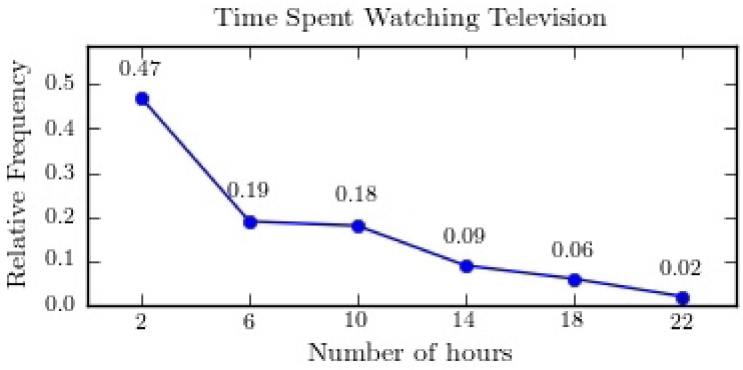
A)



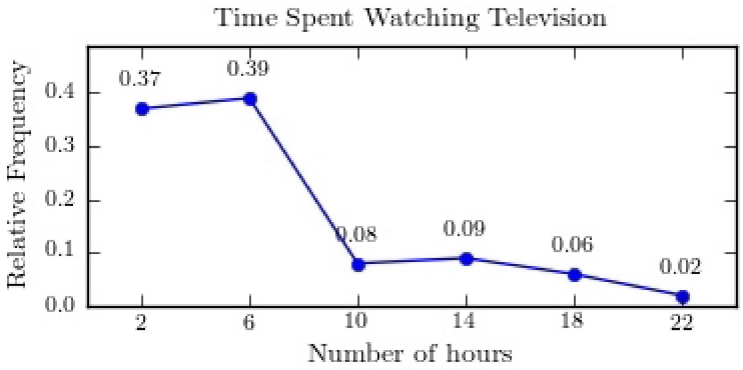

B)



C)




D)




Answer: A

An ogive is also called a cumulative frequency graph.

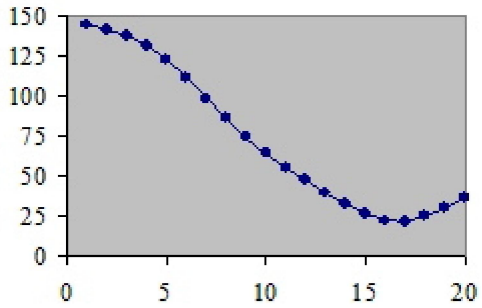
A) False

B) True

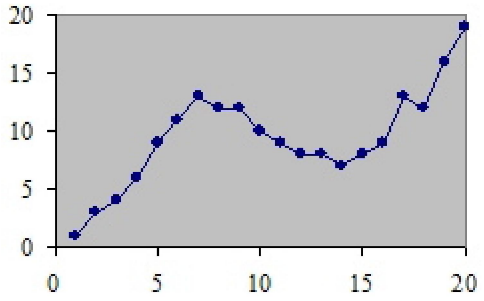
Answer: B

Which of the following could be an ogive?

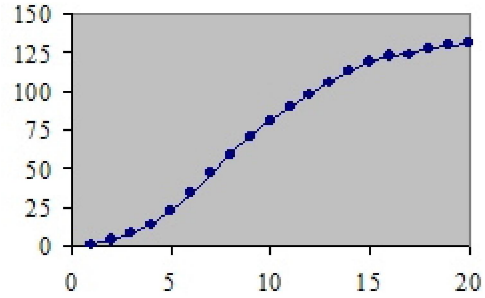
A)



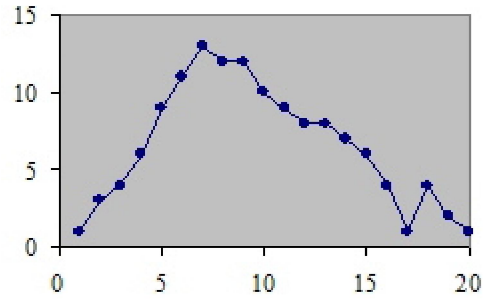
B)




C)




D)



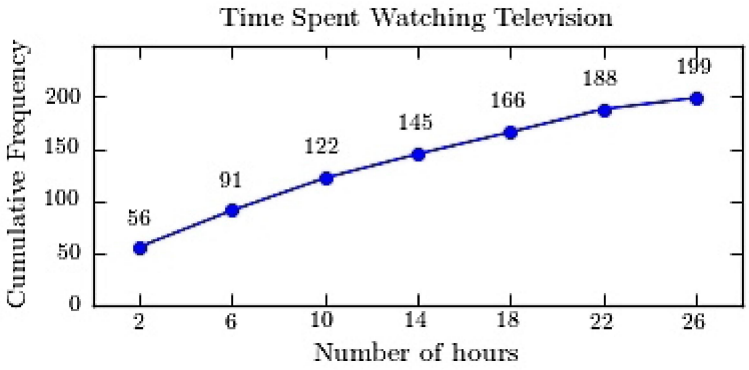

Answer: C

A sample of 200 high school students were asked how many hours per week they spend watching television.The following frequency distribution presents the results.

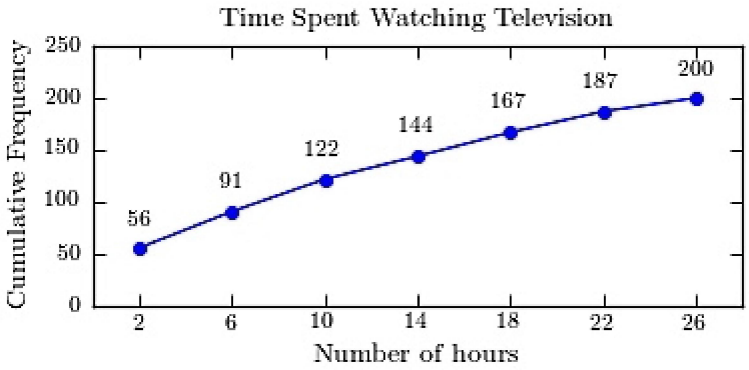
| Time Spent Watching Television | |
|---|---|
| Number of hours | Frequency |
| 0.0-3.9 | 56 |
| 4.0-7.9 | 35 |
| 8.0-11.9 | 31 |
| 12.0-15.9 | 23 |
| 16.0-19.9 | 21 |
| 20.0-23.9 | 21 |
| 24.0-27.9 | 13 |

Construct a frequency ogive for the frequency distribution.

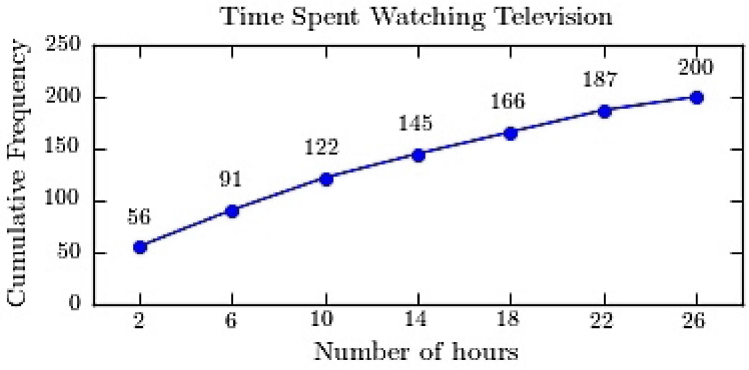
A)



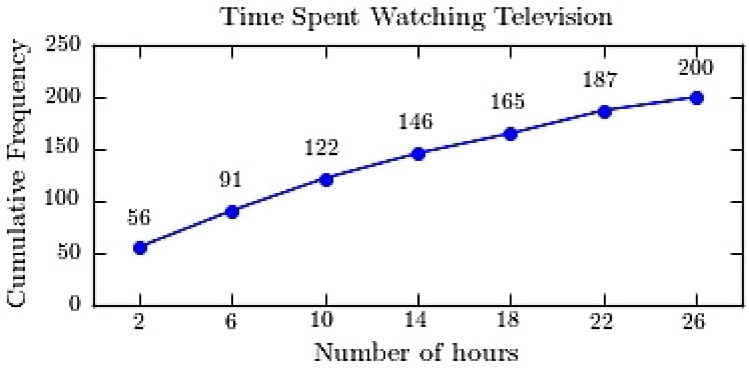

B)




C)




D)



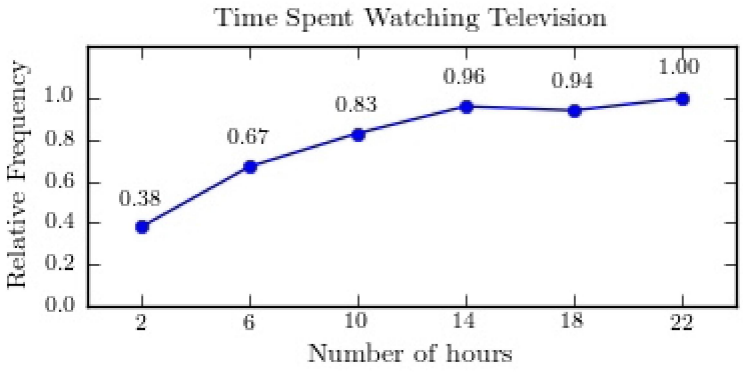
Answer: C

A sample of 200 high school students were asked how many hours per week they spend watching television.The following frequency distribution presents the results.

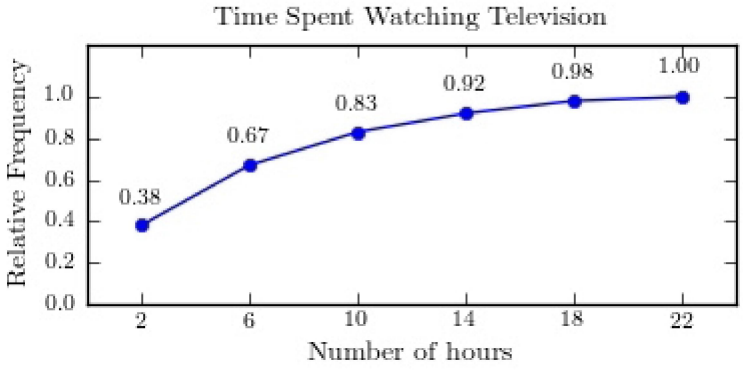
| Time Spent Watching Television | |
|---|---|
| Number of hours | Frequency |
| 0.0-3.9 | 76 |
| 4.0-7.9 | 57 |
| 8.0-11.9 | 32 |
| 12.0-15.9 | 18 |
| 16.0-19.9 | 13 |
| 20.0-23.9 | 4 |

Construct a relative frequency ogive for the frequency distribution.

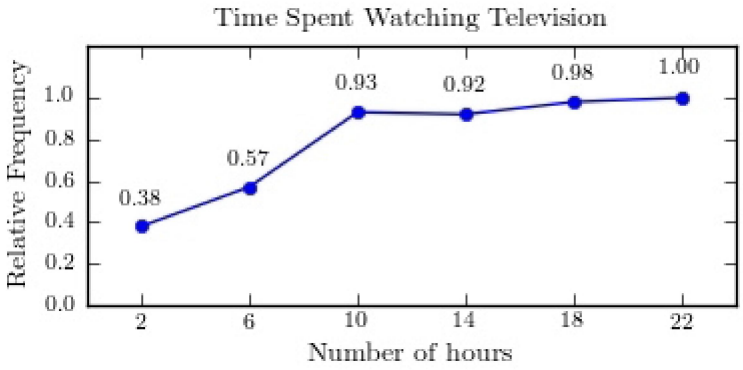
A)



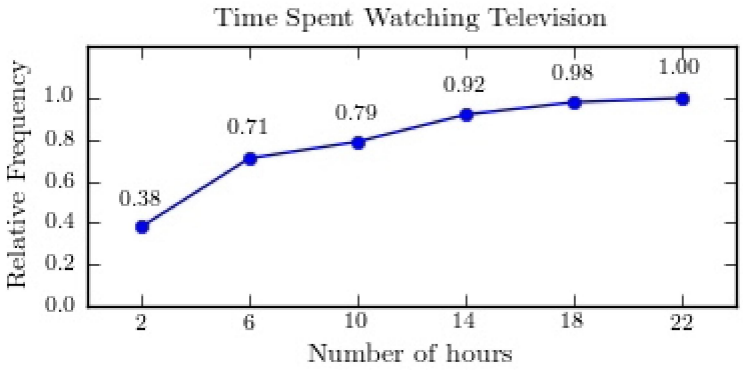

B)



C)



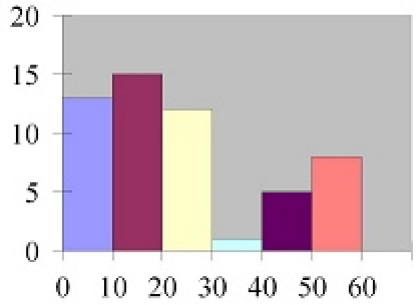

D)



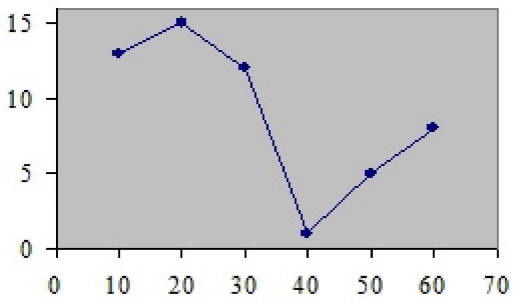

Answer: B

Which of the following is a histogram?

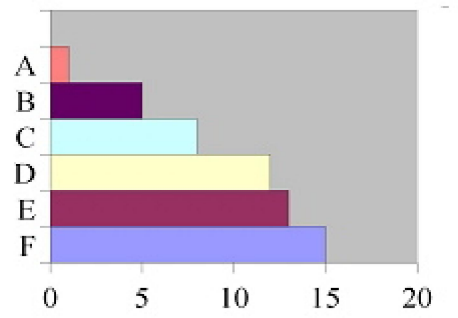
A)



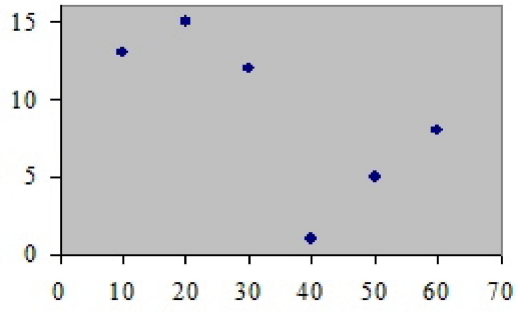

B)



C)




D)




Answer: A

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

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

Answer: A

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

A) True
B) False

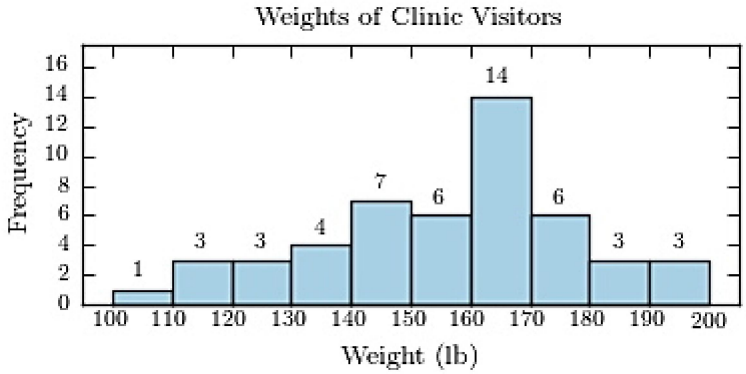
Answer: B

The following frequency distribution presents the weights in pounds (lb) of a sample of visitors to a health clinic.

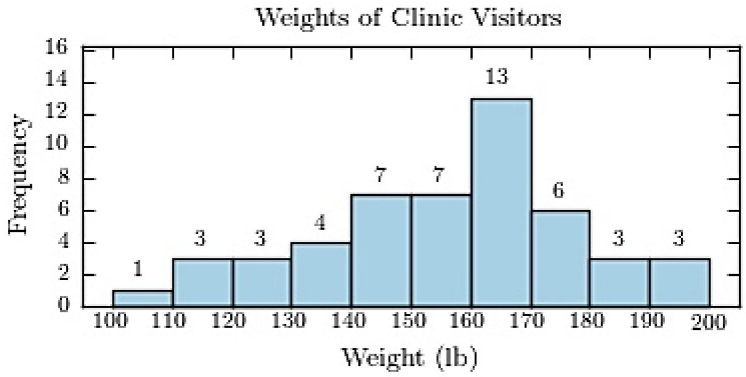
| Weights of Clinic Visitors | |
|---|---|
| Weight (lb) | Frequency |
| 100–109 | 1 |
| 110–119 | 3 |
| 120–129 | 3 |
| 130–139 | 4 |
| 140–149 | 7 |
| 150–159 | 7 |
| 160–169 | 13 |
| 170–179 | 6 |
| 180–189 | 3 |
| 190–199 | 3 |

Construct a frequency histogram.

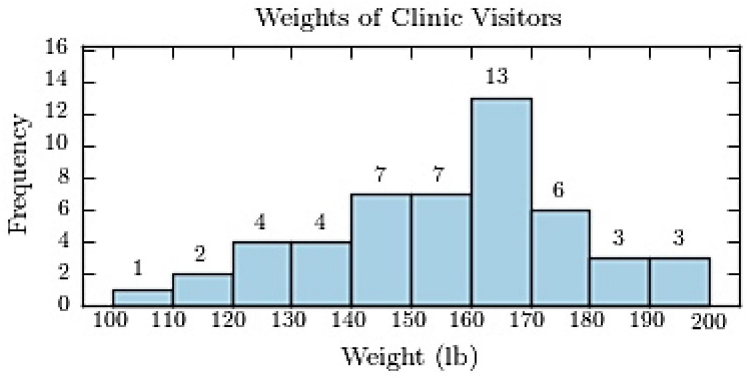
A)



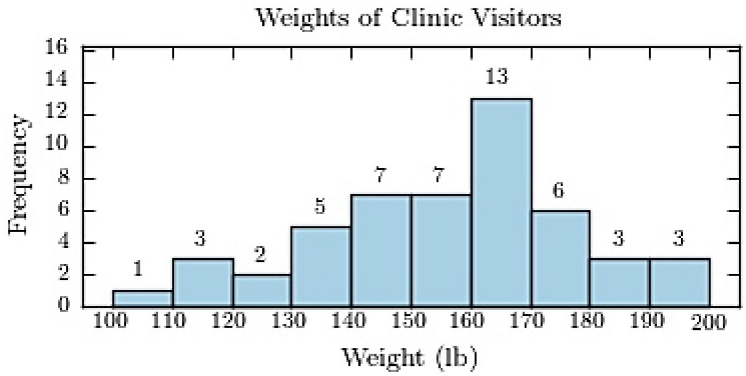

B)



C)




D)



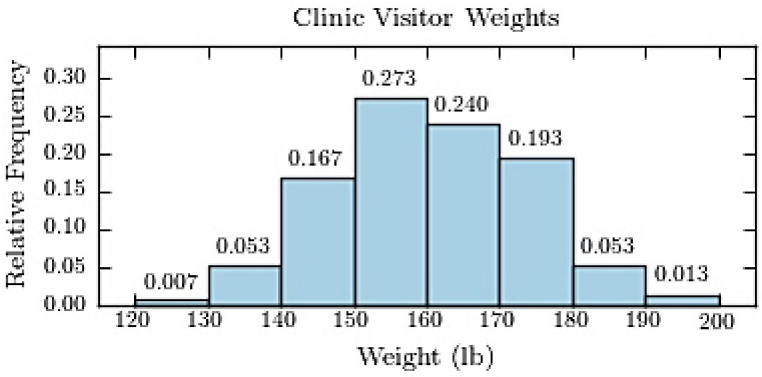

Answer: B

The following frequency distribution presents the weights in pounds (lb) of a sample of visitors to a health clinic.

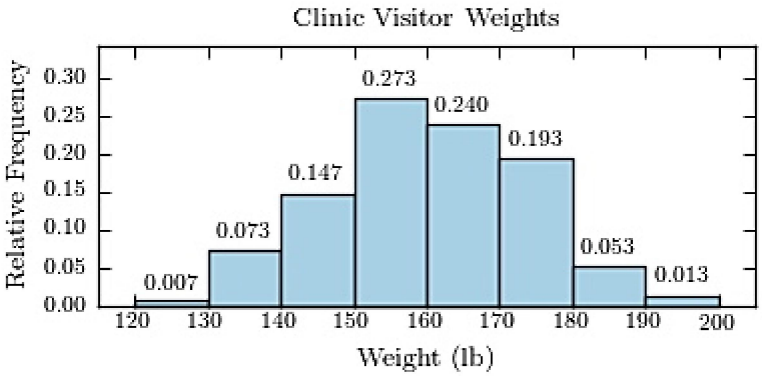
| Clinic Visitor Weights | |
|---|---|
| Weight (lb) | Frequency |
| 120-129 | 1 |
| 130-139 | 11 |
| 140-149 | 22 |
| 150-159 | 41 |
| 160-169 | 36 |
| 170-179 | 29 |
| 180-189 | 8 |
| 190-199 | 2 |

Construct a relative frequency histogram.

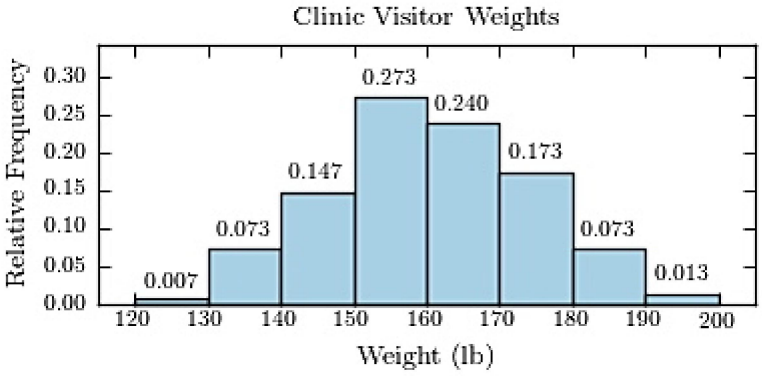
A)



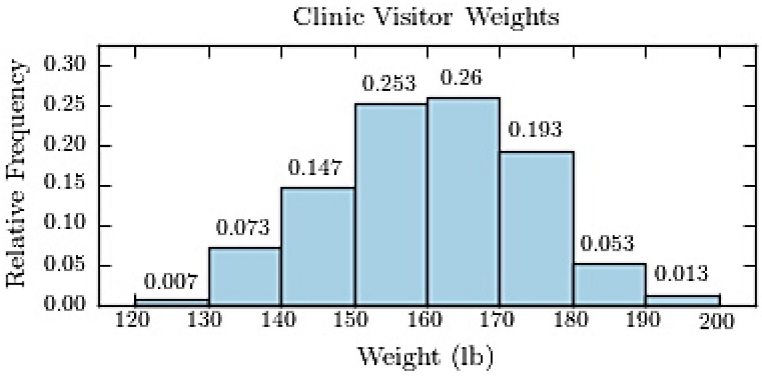

B)




C)




D)



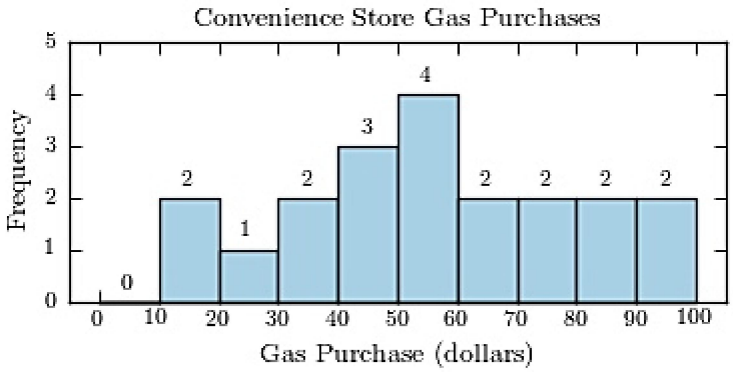
Answer: B

The following table presents the purchase totals (in dollars) of a random sample of gasoline purchases at a convenience store.

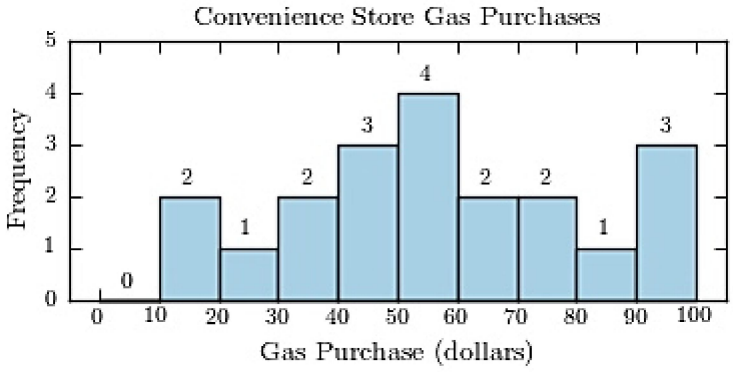
Construct a frequency histogram using a class width of 10, and using 0 as the lower class limit for the first class.

| | | | | |
|---|---|---|---|---|
| 69 | 55 | 17 | 55 | 81 |
| 66 | 99 | 44 | 34 | 79 |
| 22 | 83 | 91 | 15 | 35 |
| 53 | 74 | 40 | 55 | 49 |

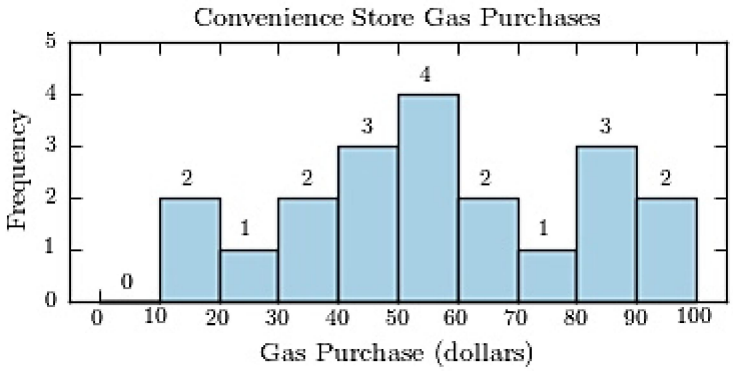
A)



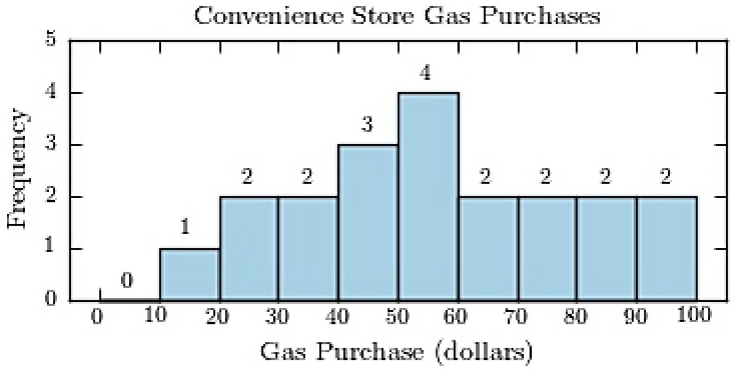

B)



C)




D)



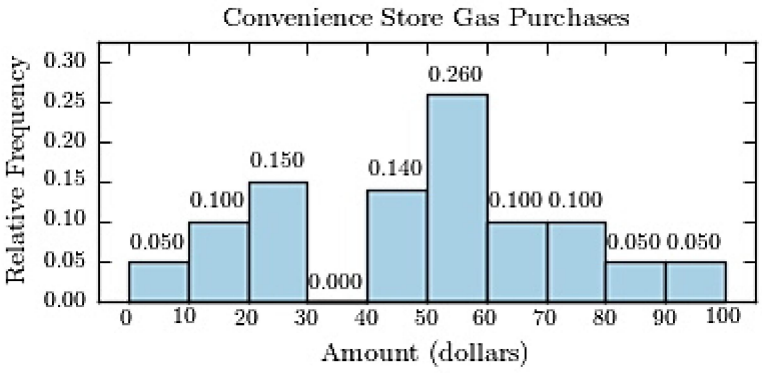

Answer: A

The following table presents the purchase totals (in dollars) of a random sample of gasoline purchases at a convenience store.

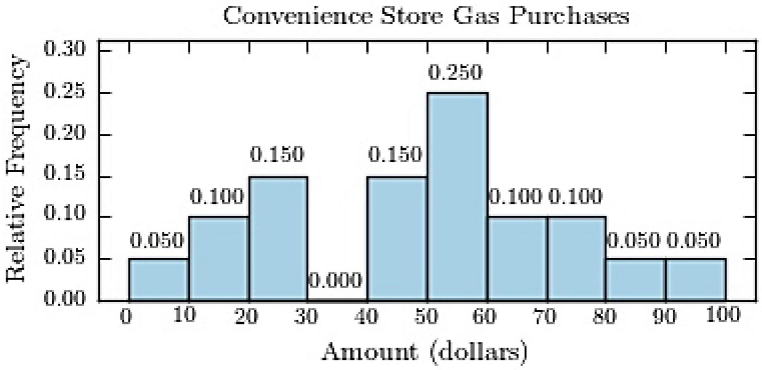
Construct a relative frequency histogram using a class width of 10, and using 0 as the lower class limit for the first class.

| | | | | |
|---|---|---|---|---|
| 22.75 | 53.99 | 60.56 | 86.86 | 10.98 |
| 28.88 | 77.87 | 5.04 | 68.60 | 40.07 |
| 74.42 | 52.19 | 94.89 | 29.08 | 50.87 |
| 13.49 | 50.49 | 43.20 | 55.53 | 49.59 |

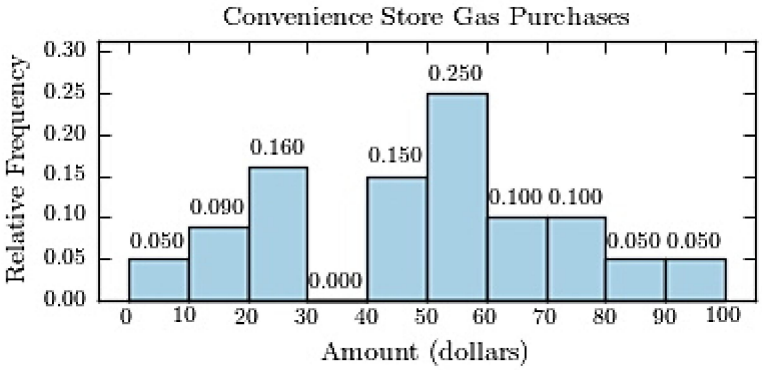
A)



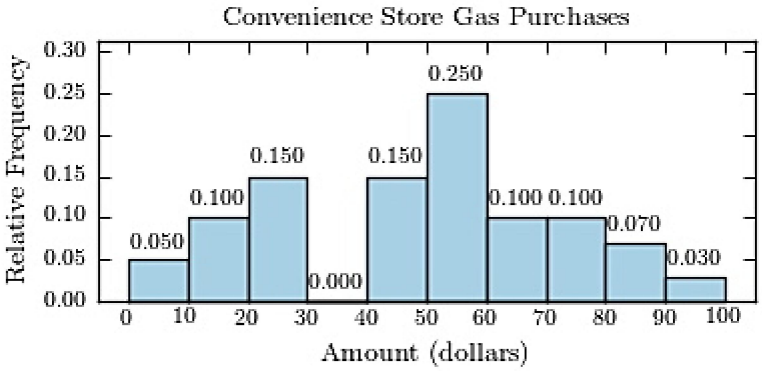

B)




C)




D)



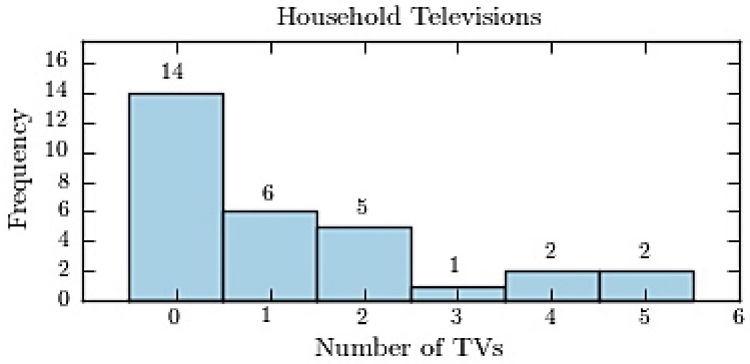
Answer: B

Thirty households were surveyed for the number of televisions in each home. Following are the results.

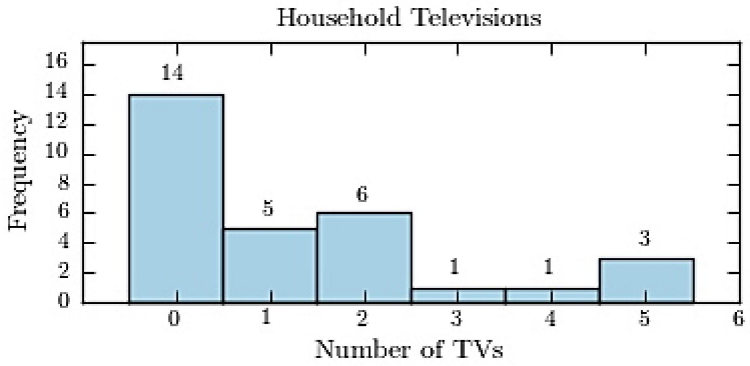
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 2 | 1 | 2 | 4 | 2 | 1 | 1 |
| 0 | 0 | 0 | 0 | 1 | 5 | 0 | 2 | 0 | 0 |
| 0 | 0 | 2 | 1 | 0 | 0 | 5 | 5 | 3 | 0 |

Construct a frequency histogram.

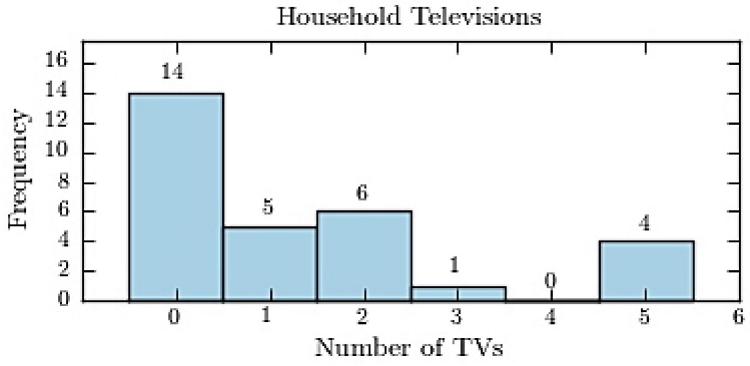
A)



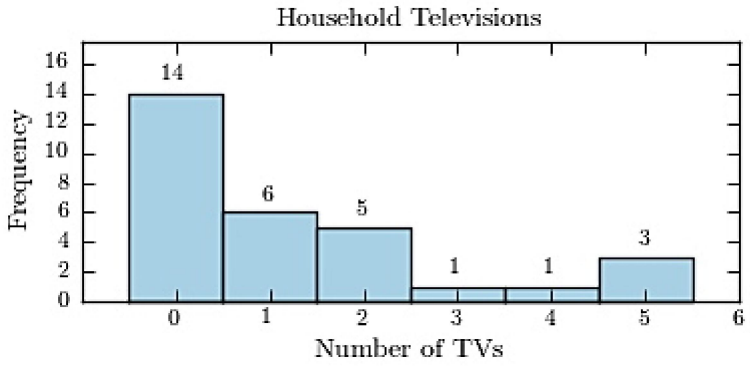

B)




C)



D)



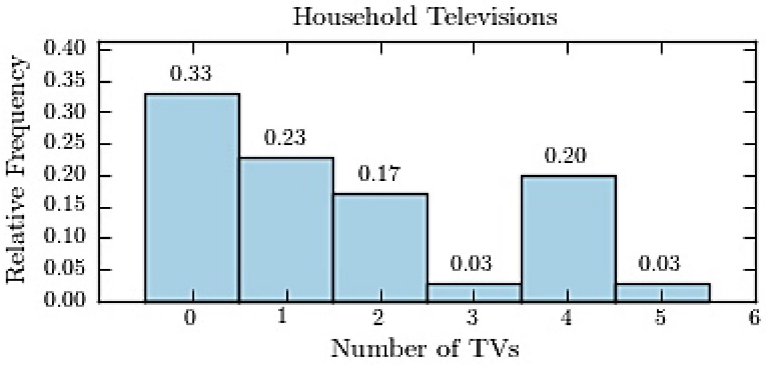

Answer: D

Thirty households were surveyed for the number of televisions in each home. Following are the results.

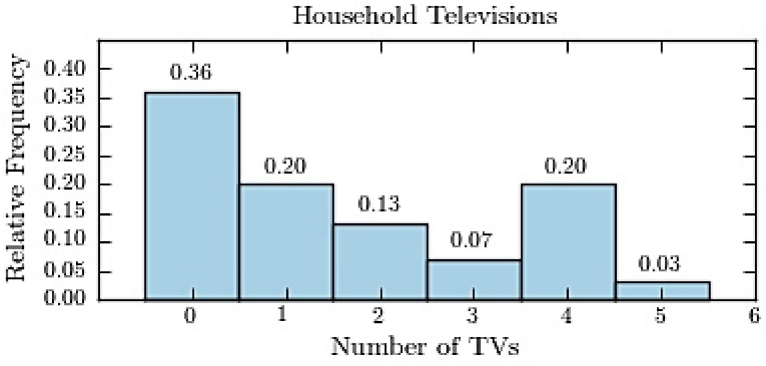
| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 1 | 0 | 2 | 1 | 0 | 2 | 1 | 1 |
| 1 | 4 | 1 | 0 | 5 | 3 | 0 | 4 | 4 | 2 |
| 1 | 4 | 0 | 2 | 0 | 4 | 4 | 3 | 0 | 0 |

Construct a relative frequency histogram.

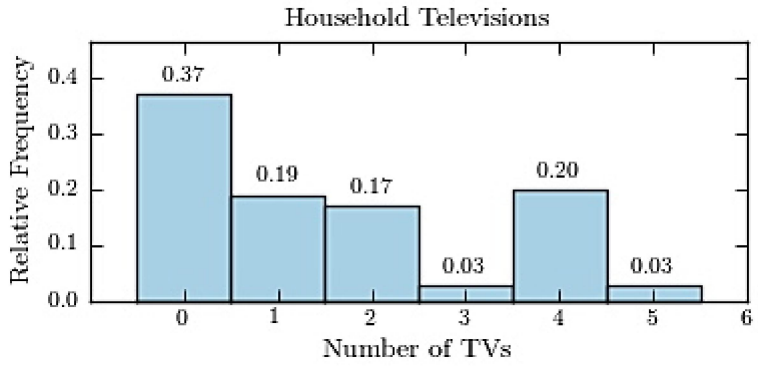
A)



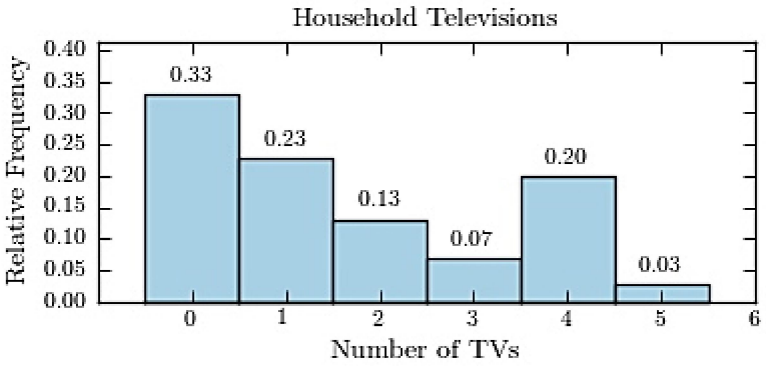

B)



C)

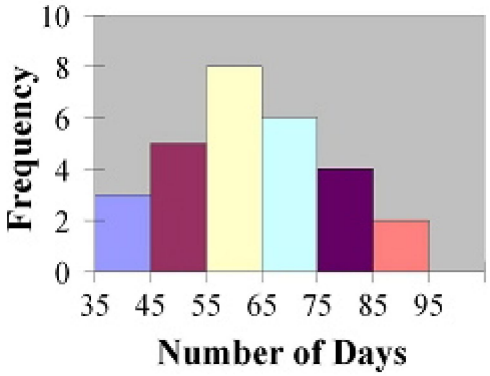



D)




Answer: D

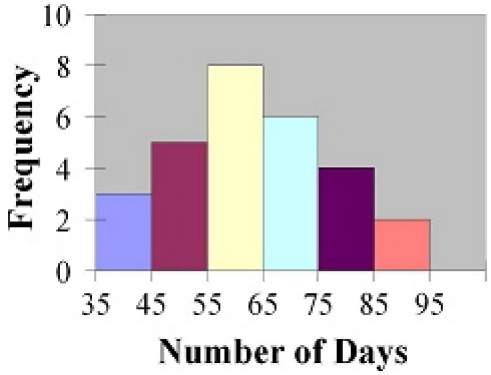
Find the class with the least number of data values.




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

Answer: D

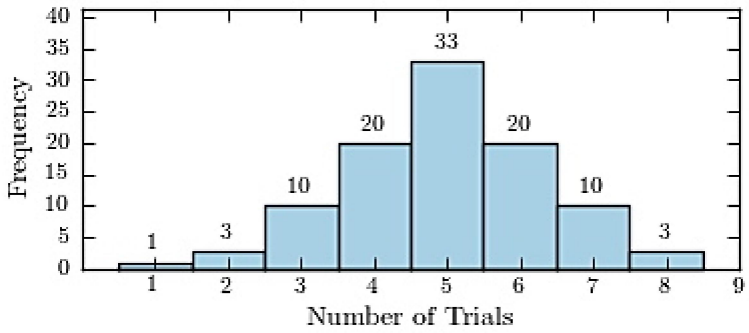
Find the class with the greatest number of data values




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

Answer: C

One hundred students are shown an eight-digit number on a piece of cardboard for three seconds and are asked to then recite the number from memory. The process is repeated until the student accurately recites the entire number from memory. The following histogram presents the number of trials it took each student to memorize the number.




How many students memorized the number in three trials or less?

A) 14
B) 86
C) 4
D) 17

Answer: A

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

A) False
B) True

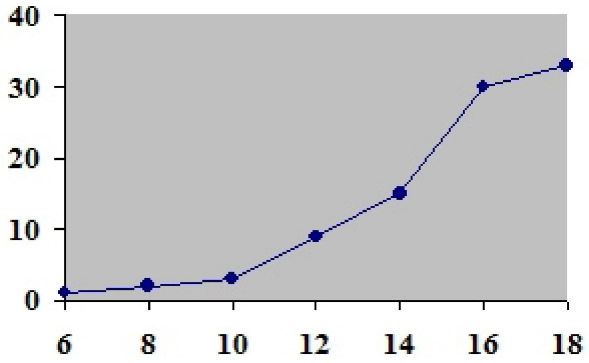
Answer: B

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

A) False
B) True

Answer: A

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




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

Answer: A

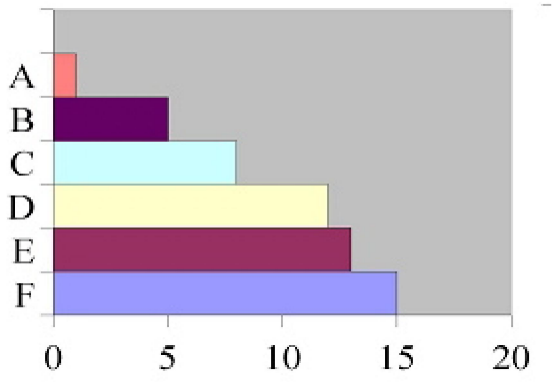
Graphs that show distributions using proportions instead of raw data as frequencies are called

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

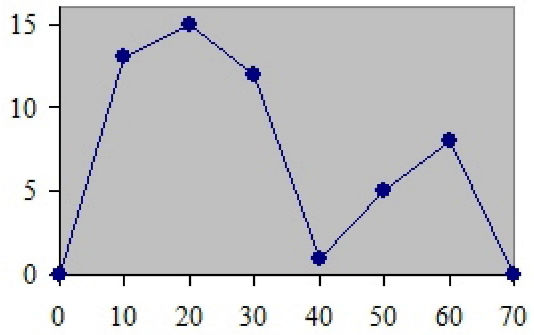
Answer: C

Which of the following is a frequency polygon?

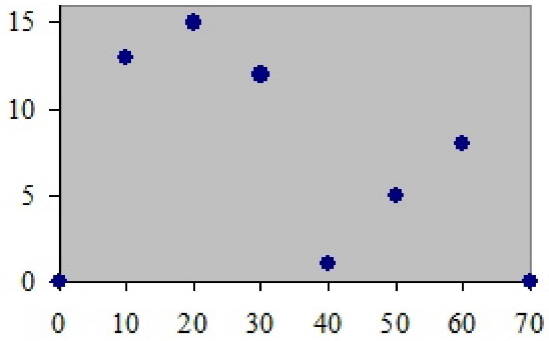
A)



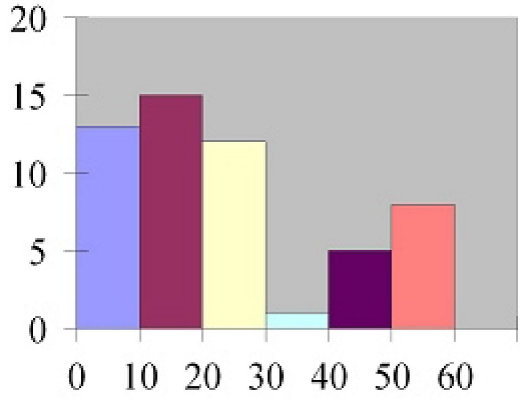
B)




C)

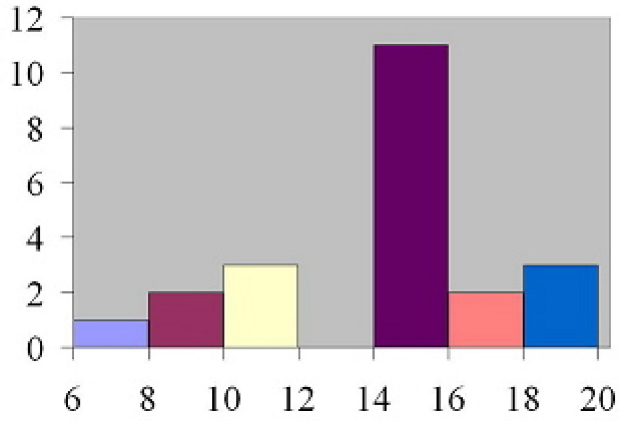



D)




Answer: B

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




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

Answer: B

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) 25
B) 44
C) 13
D) 12

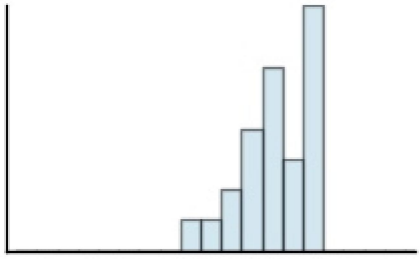
Answer: A

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 _____.

A) right-skewed
B) symmetric
C) left-skewed
D) bimodal

Answer: A

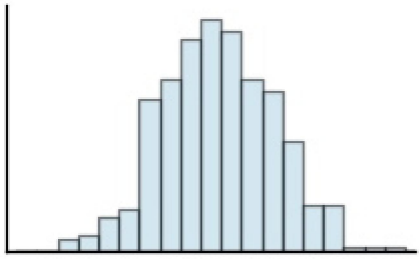
Classify the histogram as skewed to the left, skewed to the right, or approximately symmetric.



A) approximately symmetric
B) skewed to the right
C) skewed to the left

Answer: C

Classify the histogram as unimodal or bimodal.



A) unimodal
B) bimodal

Answer: A

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

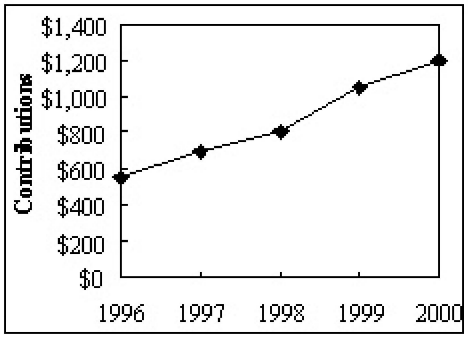
A) False
B) True

Answer: B

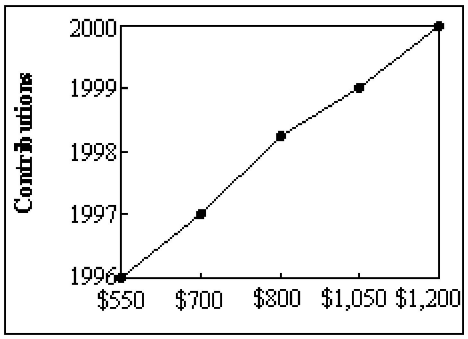
A local fundraiser wants to graphically display the contributions he has received over the past five years. Construct a time series graph for the following data.

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

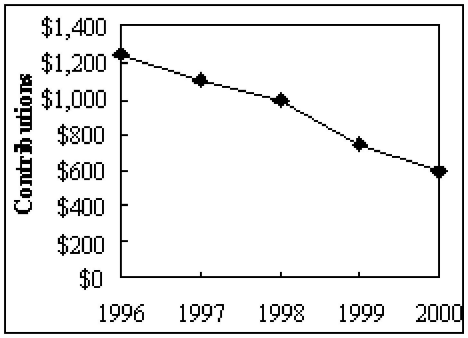
A)



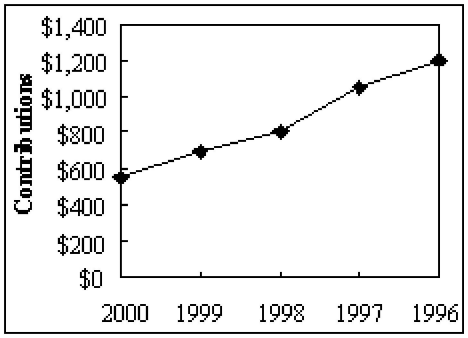

B)




C)




D)




Answer: A

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

Answer: D

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

A) False
B) True

Answer: B

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

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

Answer: B

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

A) False
B) True

Answer: B

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

A) bar
B) pie
C) time series
D) Pareto

Answer: C

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.

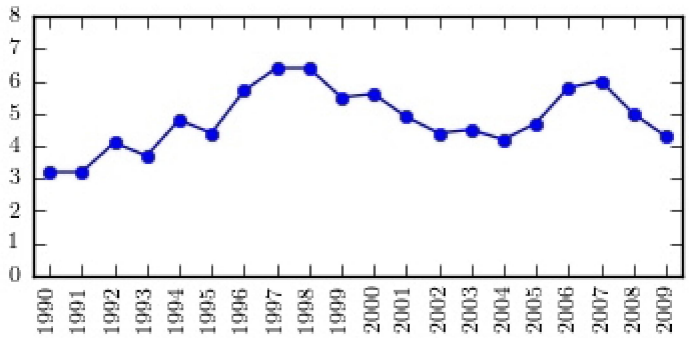
A) True
B) False

Answer: A

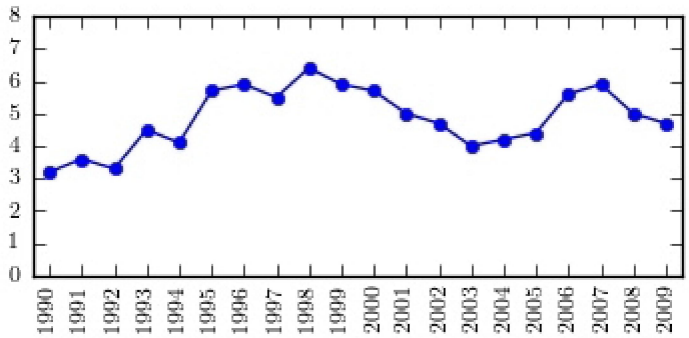
The following table presents the rate of population growth of a suburb of Atlanta, Georgia for each of the years 1990 through 2009. Construct a time-series plot of the growth rate.

| Year | Percent Growth | Year | Percent Growth |
|---|---|---|---|
| 1990 | 3.8 | 2000 | 5.7 |
| 1991 | 3.7 | 2001 | 5.3 |
| 1992 | 4.0 | 2002 | 4.4 |
| 1993 | 3.7 | 2003 | 4.2 |
| 1994 | 4.7 | 2004 | 3.9 |
| 1995 | 5.6 | 2005 | 4.8 |
| 1996 | 5.3 | 2006 | 5.3 |
| 1997 | 5.5 | 2007 | 6.4 |
| 1998 | 6.2 | 2008 | 5.2 |
| 1999 | 5.7 | 2009 | 4.4 |

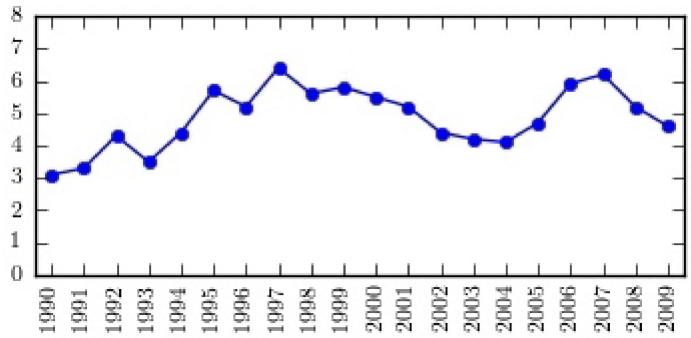
A)



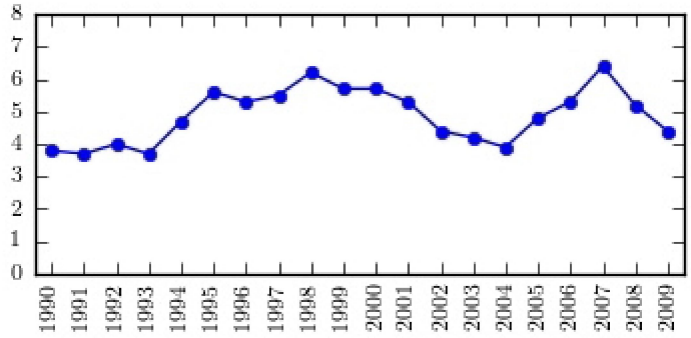

B)



C)

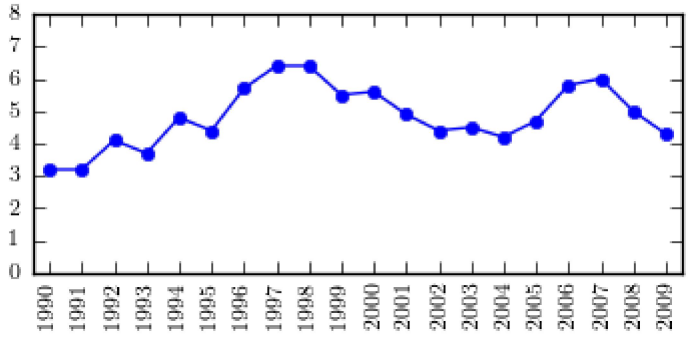



D)




Answer: D

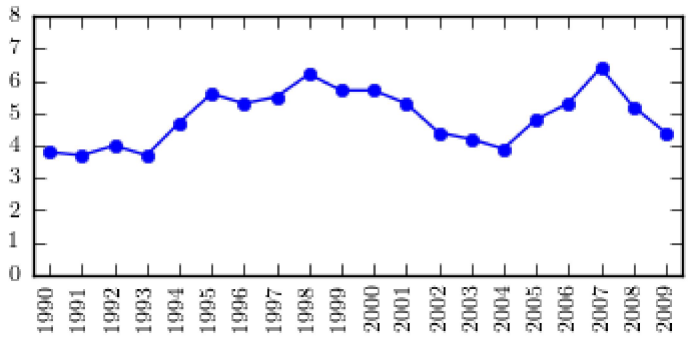
The following time-series plot presents the population growth (in percent) of a suburb of Atlanta, Georgia for each of the years 1990 through 2009. Estimate the rate of growth in 1992.




A) 3.4%
B) 3.1%
C) 3.9%
D) 4.2%

Answer: D

The following time-series plot presents the population growth (in percent) of a suburb of Atlanta, Georgia for each of the years 1990 through 2009. Estimate the amount by which the rate of growth changed from 1995 to 2004.




A) about -1.9 percentage points
B) about -1.4 percentage points
C) about -1.3 percentage points
D) about -2.7 percentage points

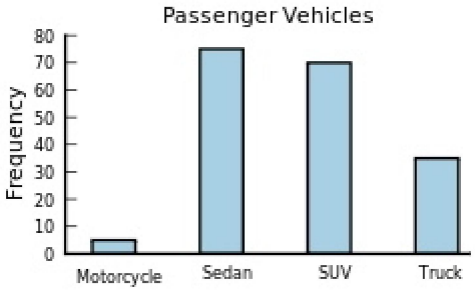
Answer: A

The following frequency distribution presents the frequency of passenger vehicles that pass through a certain intersection from 8:00 AM to 9:00 AM on a particular day.

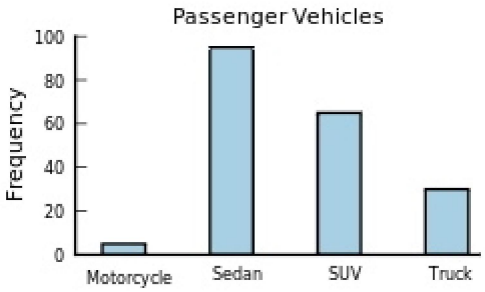
| Vehicle Type | Frequency |
|---|---|
| Motorcycle | 5 |
| Sedan | 95 |
| SUV | 65 |
| Truck | 30 |

Construct a frequency bar graph for the data.

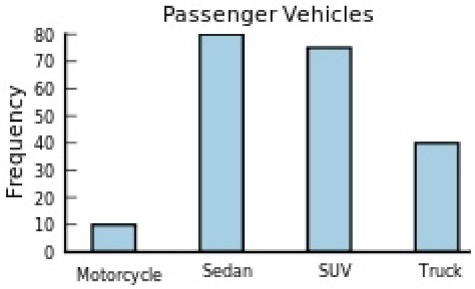
A)



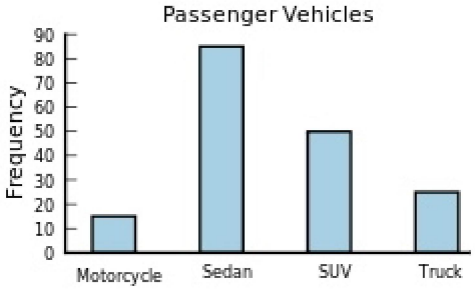
B)




C)



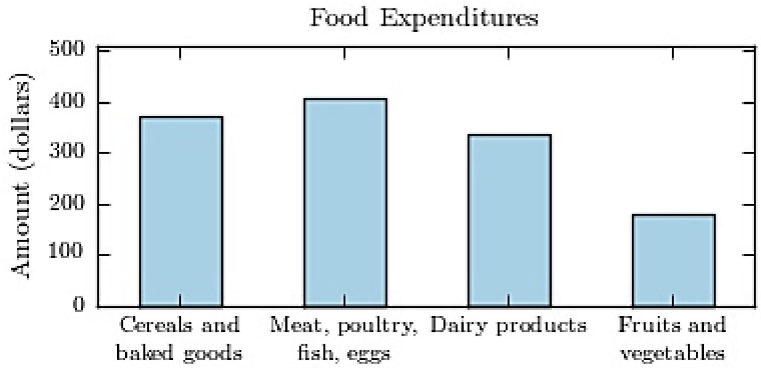

D)




Answer: B

The following bar graph presents the average amount a certain family spent, in dollars, on various food categories in a recent year.

On which food category was the most money spent?




A) Dairy products
B) Fruits and vegetables
C) Cereals and baked goods
D) Meat poultry, fish, eggs

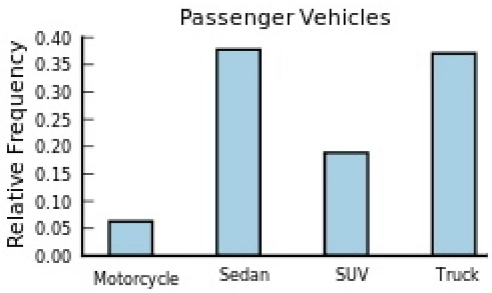
Answer: D

The following frequency distribution presents the frequency of passenger vehicles that pass through a certain intersection from 8:00 AM to 9:00 AM on a particular day.

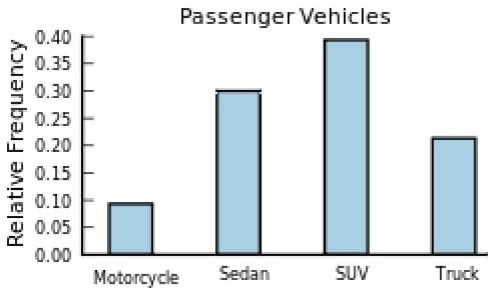
| Vehicle Type | Frequency |
|---|---|
| Motorcycle | 14 |
| Sedan | 45 |
| SUV | 59 |
| Truck | 32 |

Construct a relative frequency bar graph for the data.

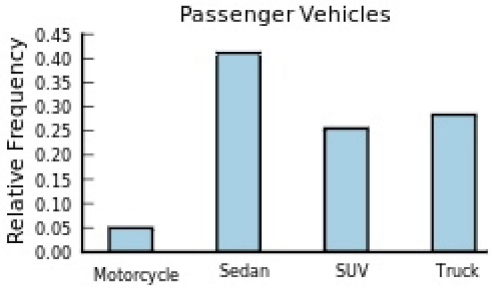
A)



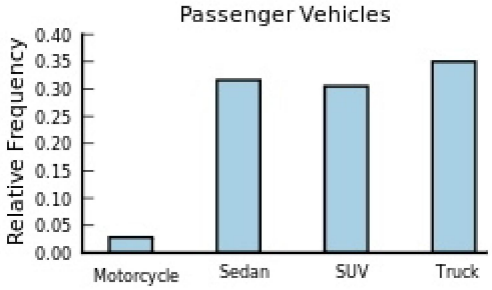
B)




C)



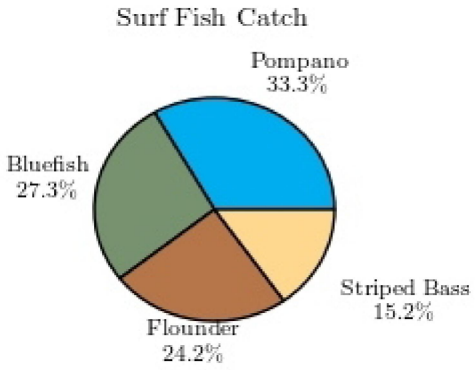

D)



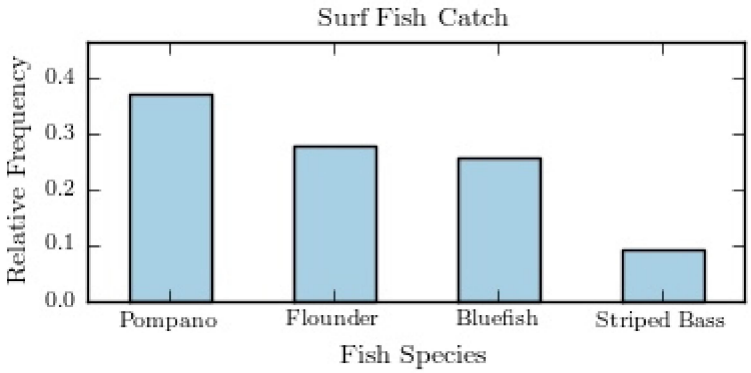

Answer: B

The following pie chart presents the percentages of fish caught in each of four ratings categories.

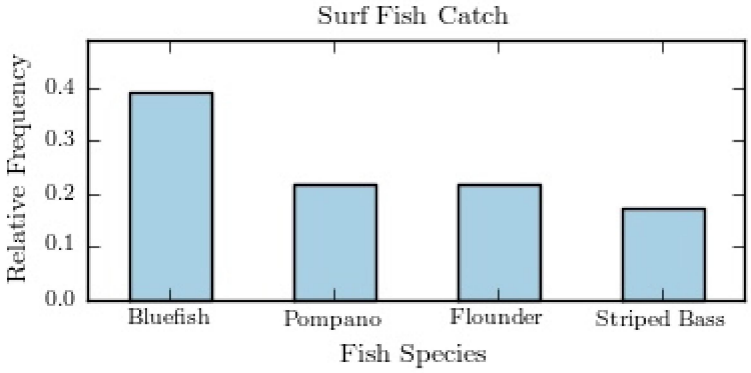
Match this pie chart with its corresponding Pareto chart.



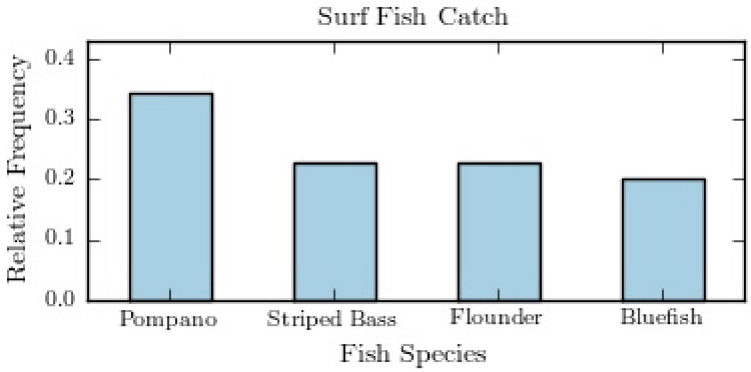
A)



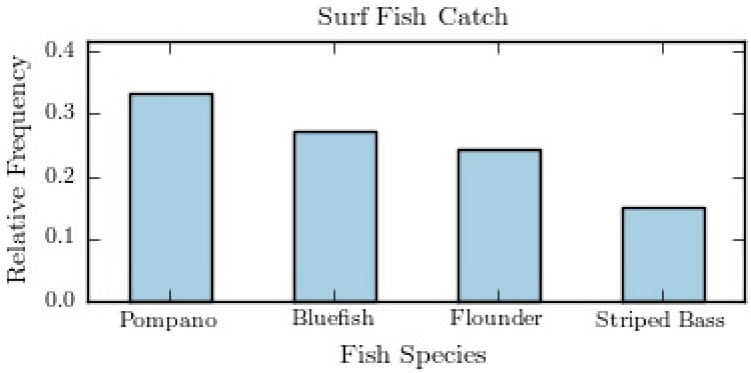

B)




C)




D)

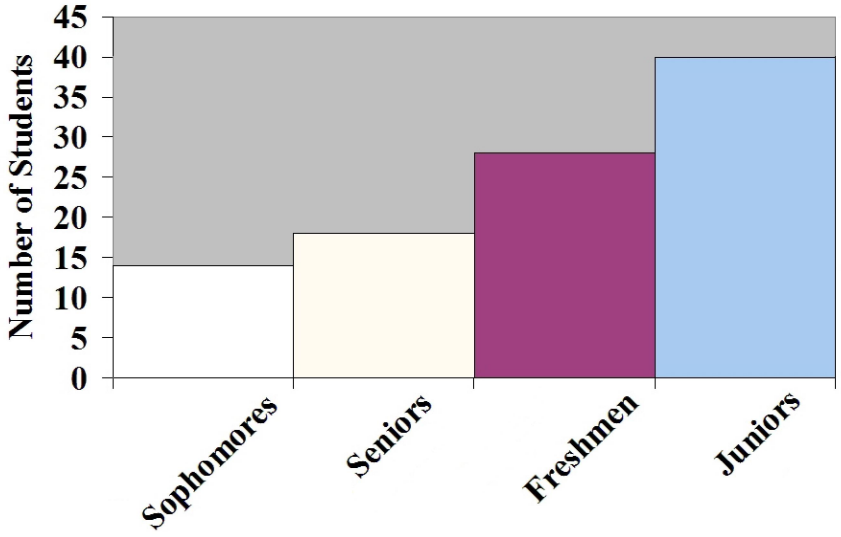


Answer: D

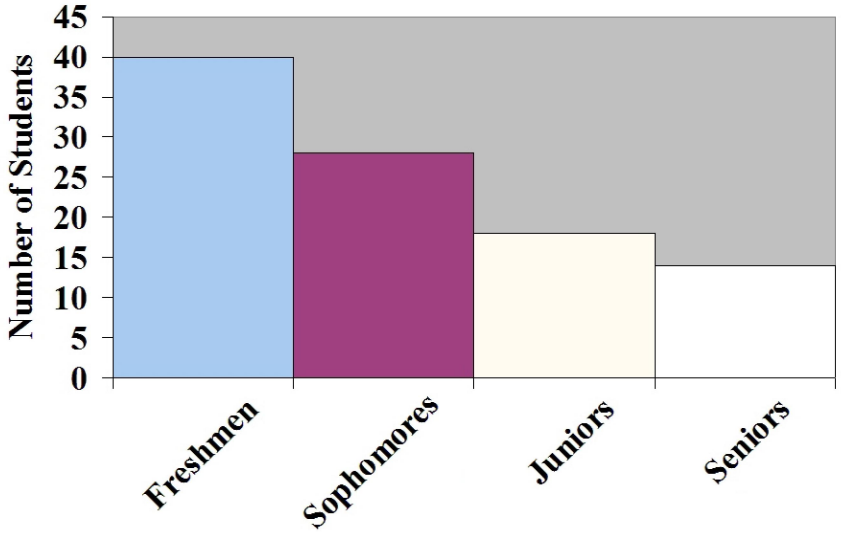
Construct a Pareto chart for the following distribution:

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

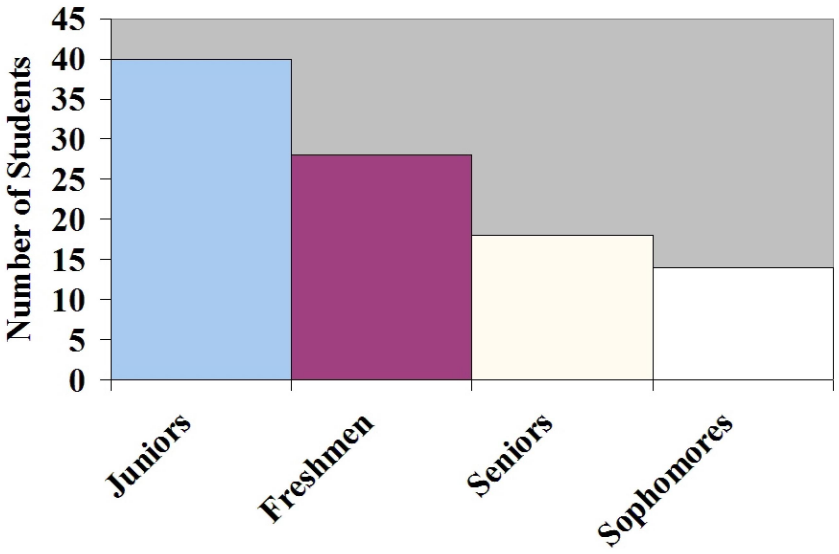
A)



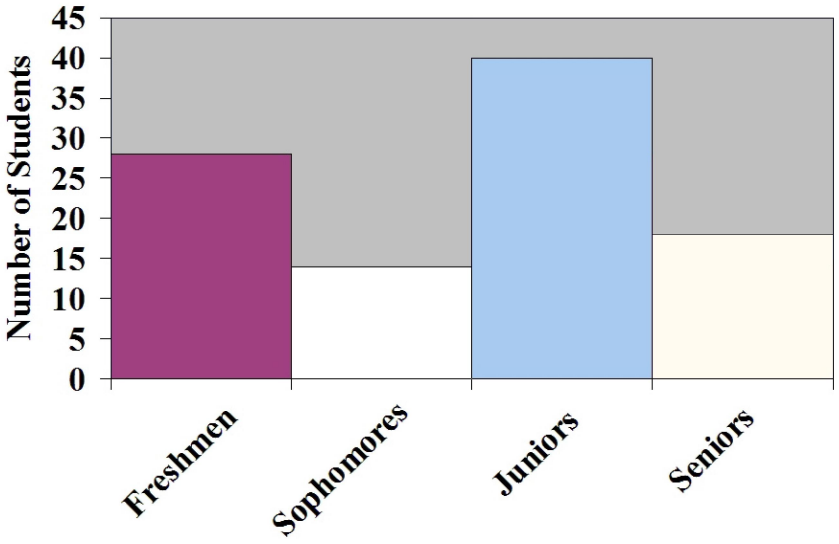

B)



C)




D)

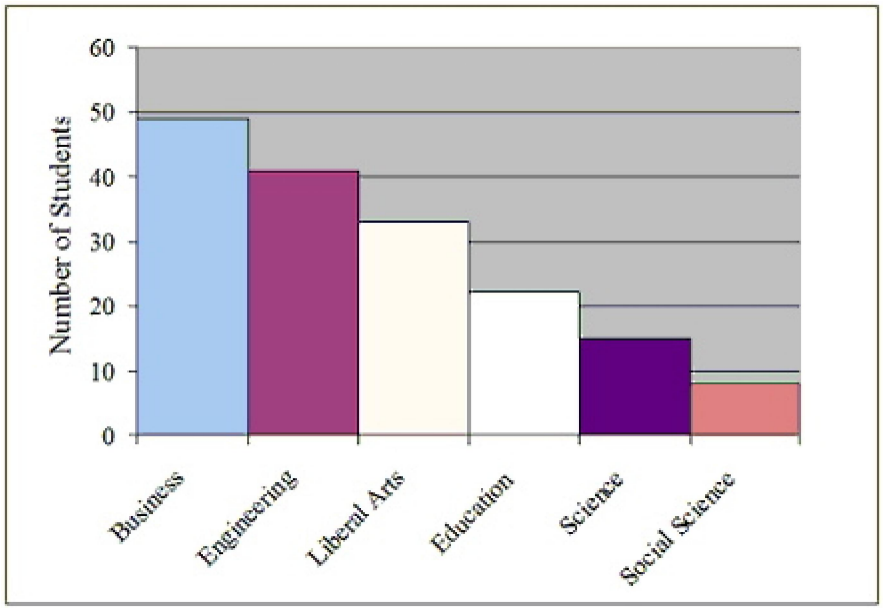



Answer: C

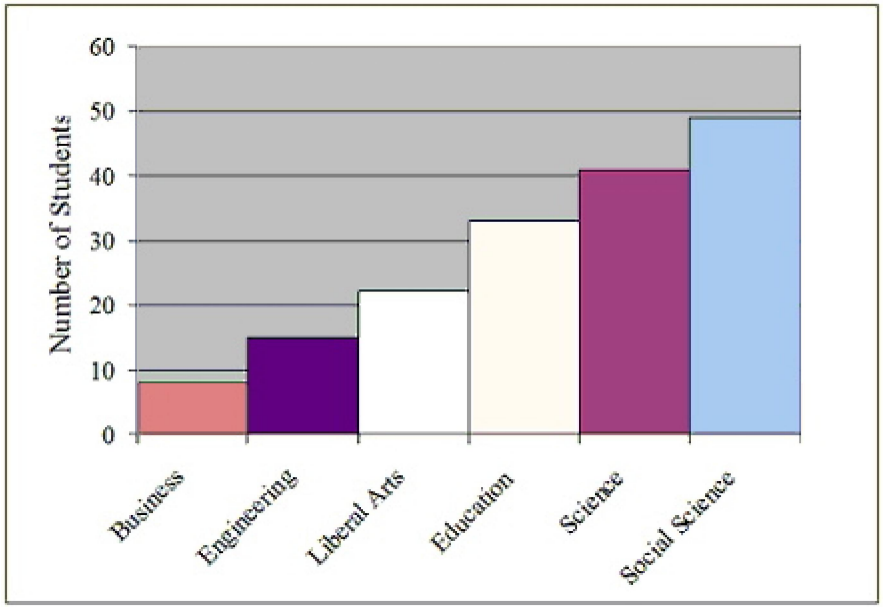
Construct a Pareto chart for the following distribution:

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

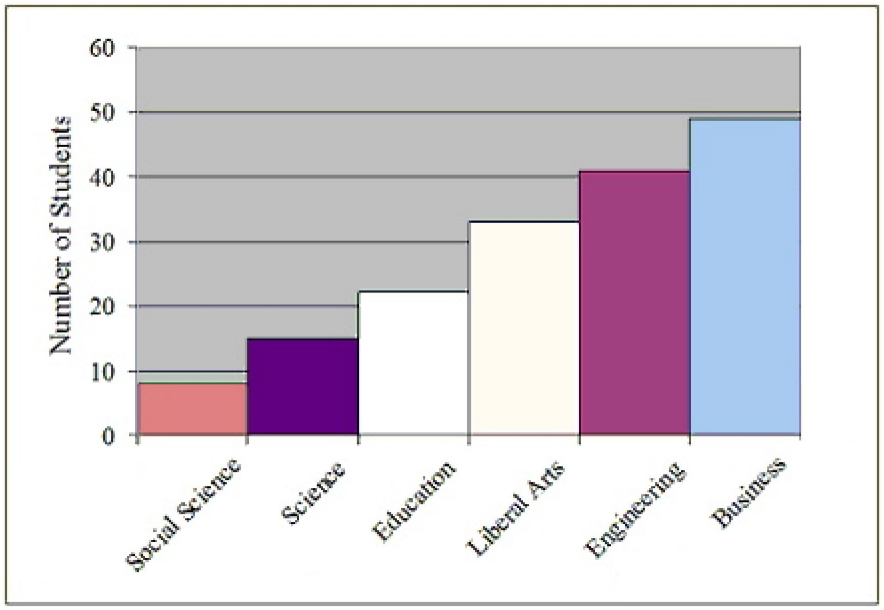
A)



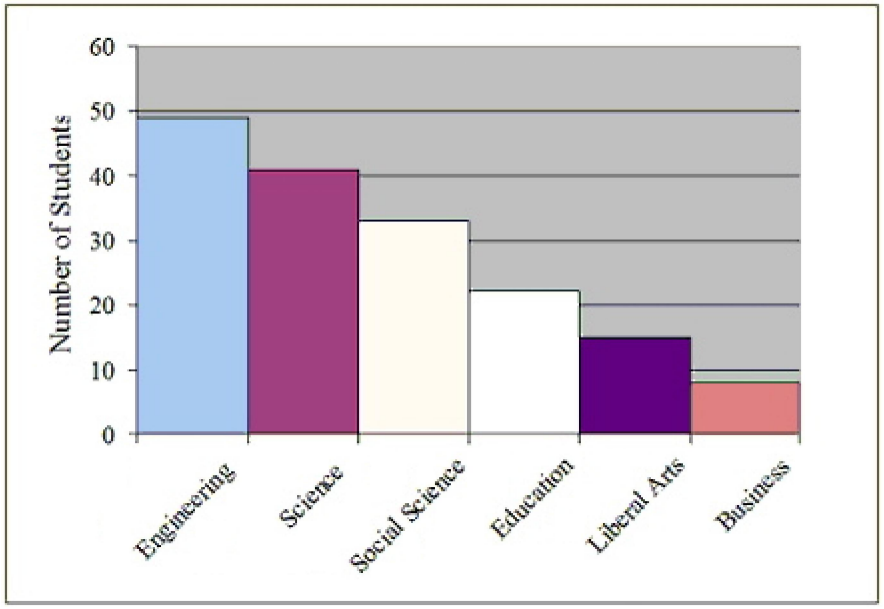

B)



C)




D)



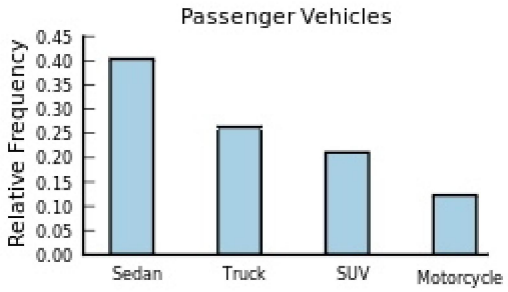

Answer: A

The following frequency distribution presents the frequency of passenger vehicles that pass through a certain intersection from 8:00 AM to 9:00 AM on a particular day.

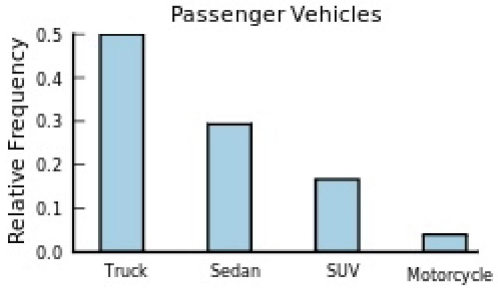
| Vehicle Type | Frequency |
|---|---|
| Motorcycle | 14 |
| Sedan | 46 |
| SUV | 24 |
| Truck | 30 |

Construct a relative frequency Pareto chart for the data.

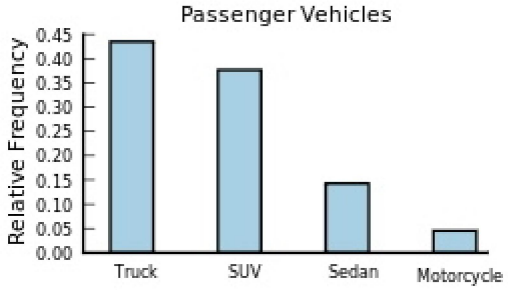
A)



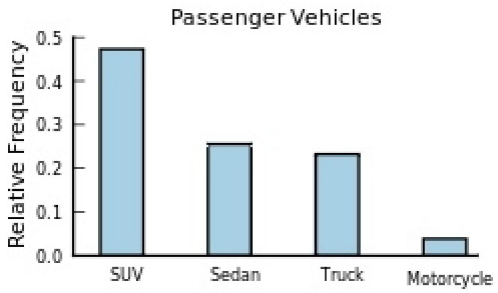

B)




C)




D)




Answer: A

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

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

Answer: B

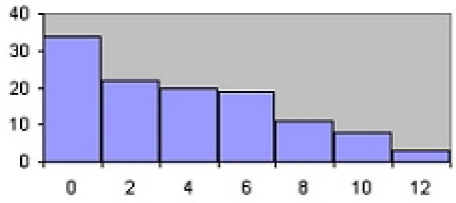
Which graph should be used to represent the frequencies with which certain courses are taken at Highlands Middle School?

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

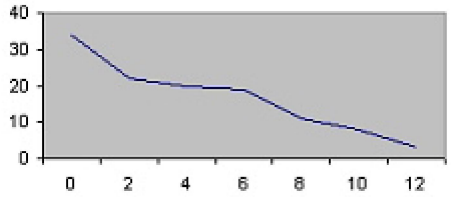
Answer: A

Which of the following is a Pareto chart?

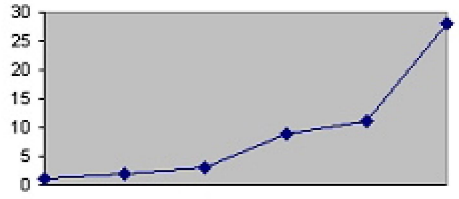
A)



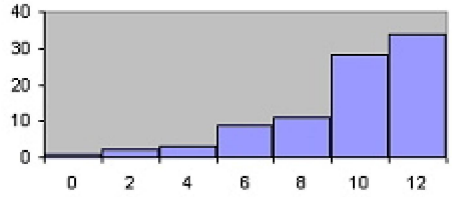

B)




C)




D)




Answer: A

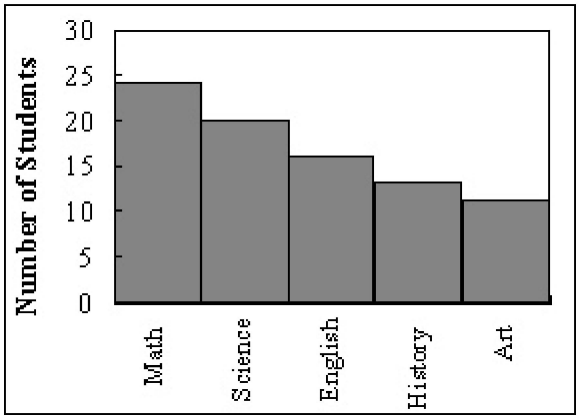
A Pareto chart is useful for showing percentages of the total at different times.

A) False

B) True

Answer: A

What type of graph is the figure below?




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

Answer: C

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

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

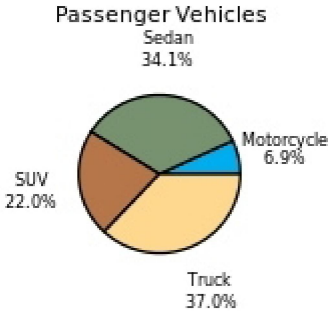
Answer: C

The following frequency distribution presents the frequency of passenger vehicles that pass through a certain intersection from 8:00 AM to 9:00 AM on a particular day.

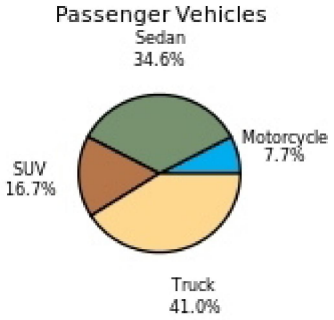
| Vehicle Type | Frequency |
|---|---|
| Motorcycle | 6 |
| Sedan | 26 |
| SUV | 30 |
| Truck | 21 |

Construct a pie chart for the data.

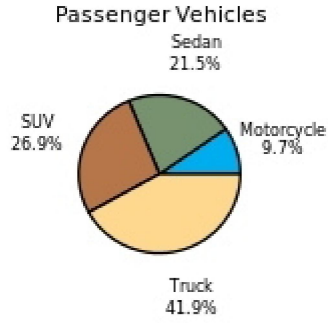
A)



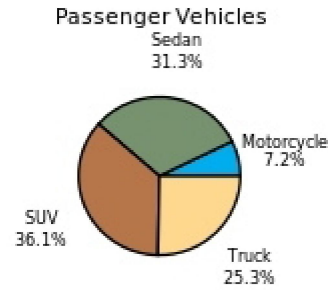

B)




C)



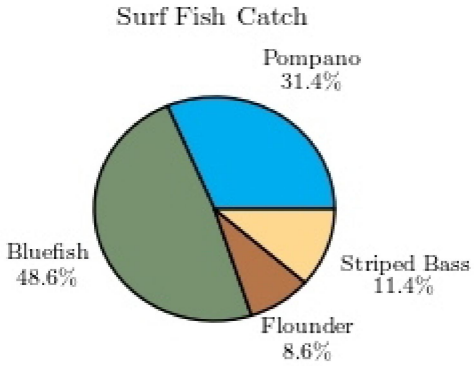

D)



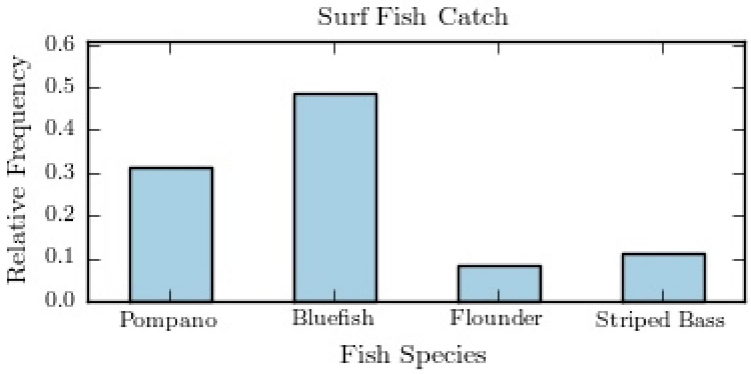

Answer: D

The following pie chart presents the percentages of fish caught in each of four ratings categories.

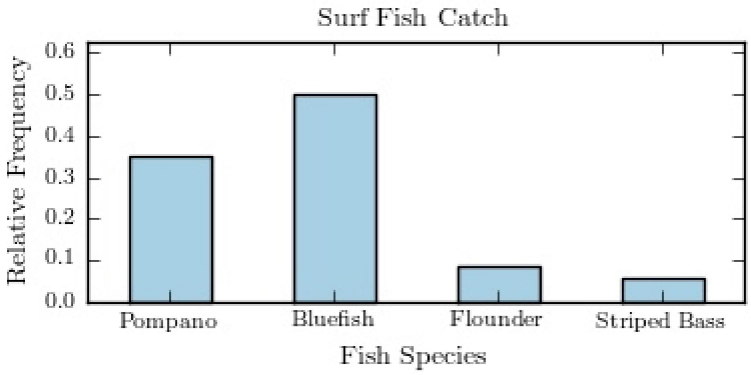
Match this pie chart with its corresponding bar graph.



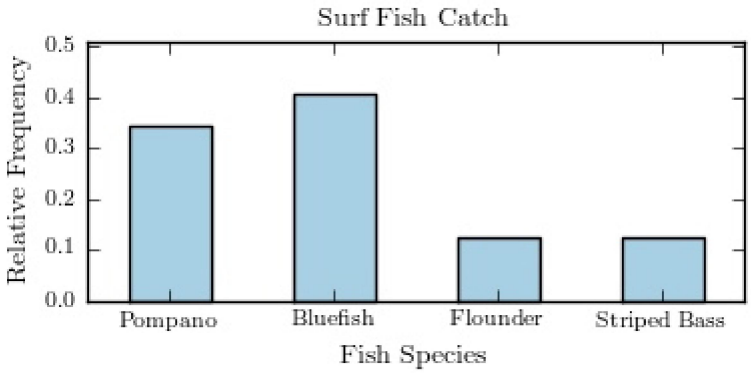

A)



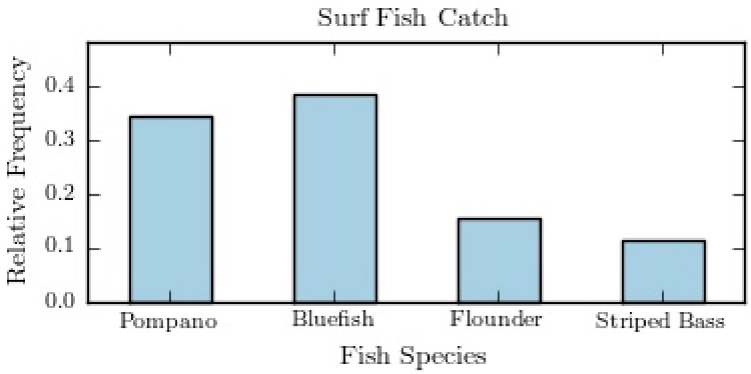

B)



C)

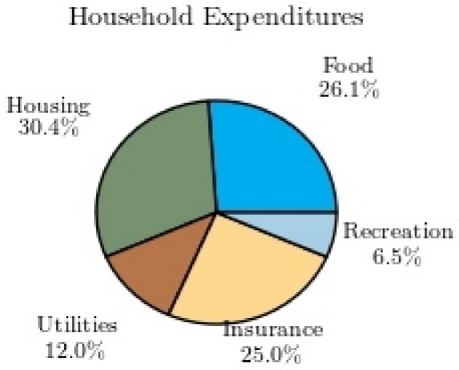



D)




Answer: A

Following is a pie chart that presents the percentages spent by a certain household on its five largest annual expenditures. What percentage of the money spent was spent on food, housing, and utilities?



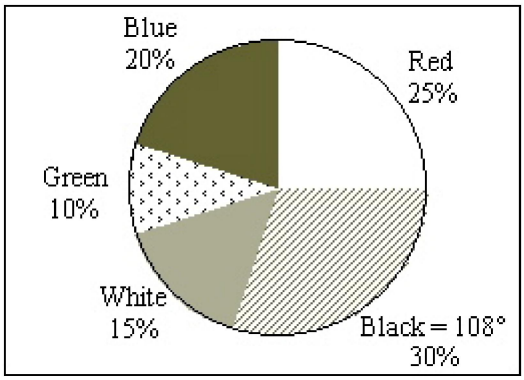

A) 56.5%
B) 68.5%
C) 63%
D) 55%

Answer: B

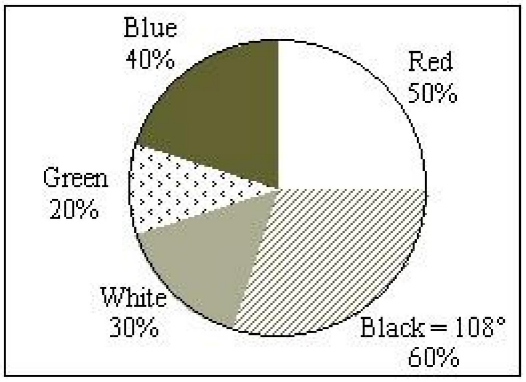
The following information shows the colors of cars preferred by customers. Draw a pie graph and indicate how many degrees that black represents in a pie graph?

| **Color** | **Number** |
|---|---|
| Red | 50 |
| Black | 60 |
| White | 30 |
| Green | 20 |
| Blue | 40 |

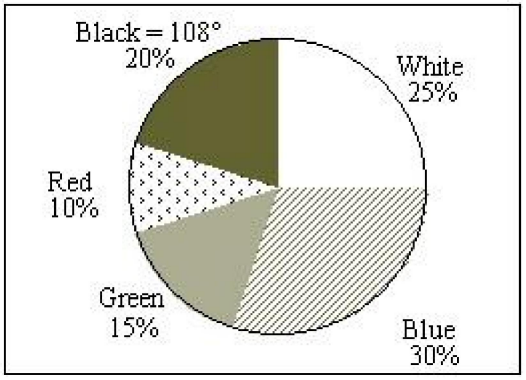
A)



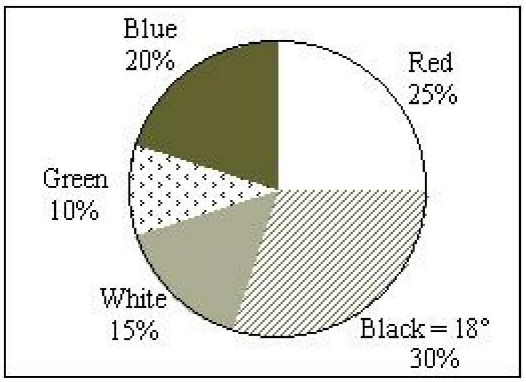

B)




C)



D)

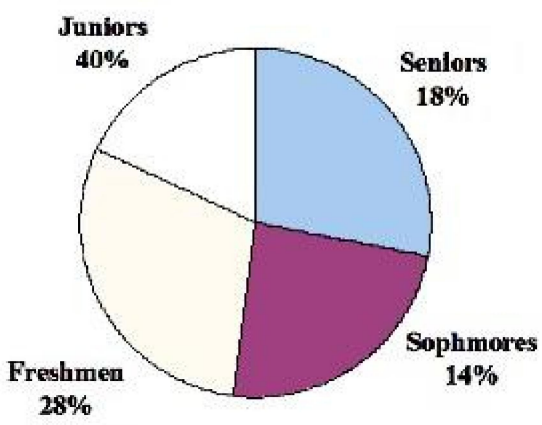



Answer: A

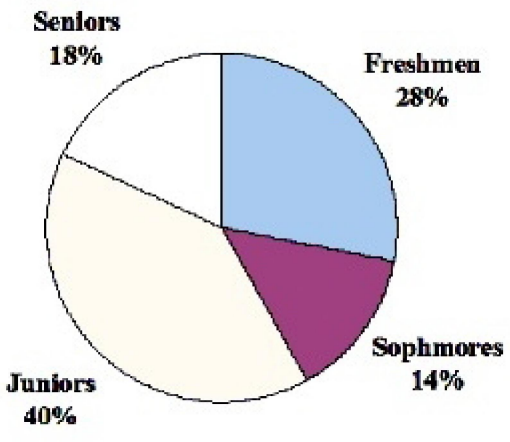
Construct a pie chart for the following distribution:

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

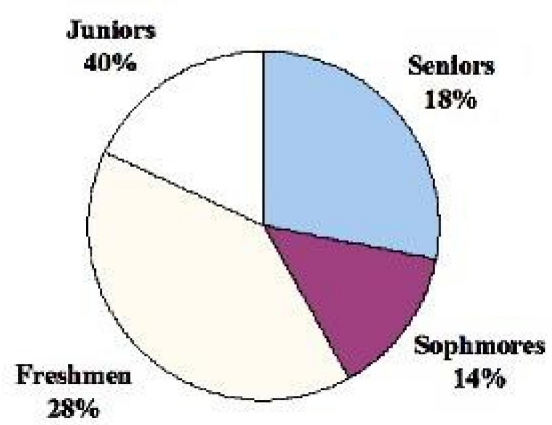
A)



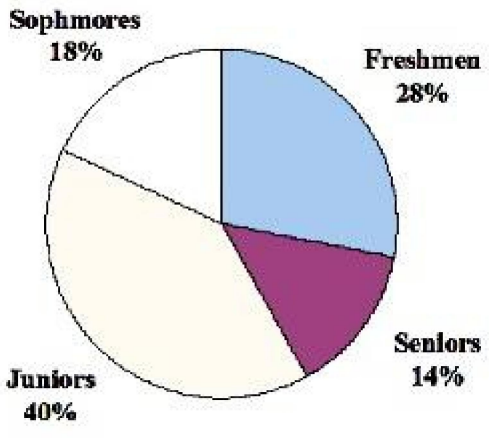
B)




C)



D)

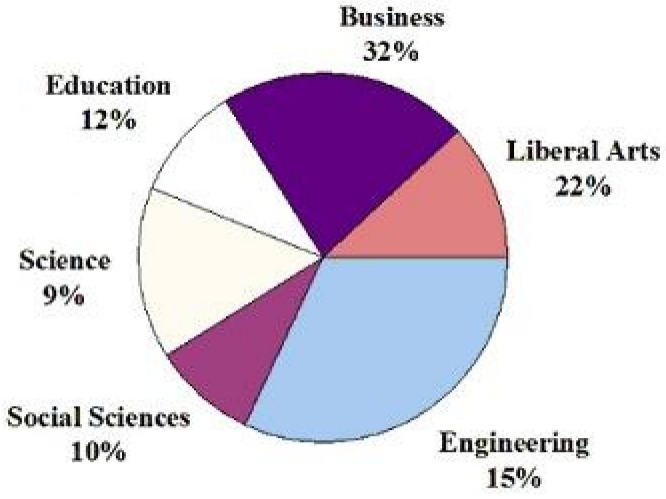



Answer: B

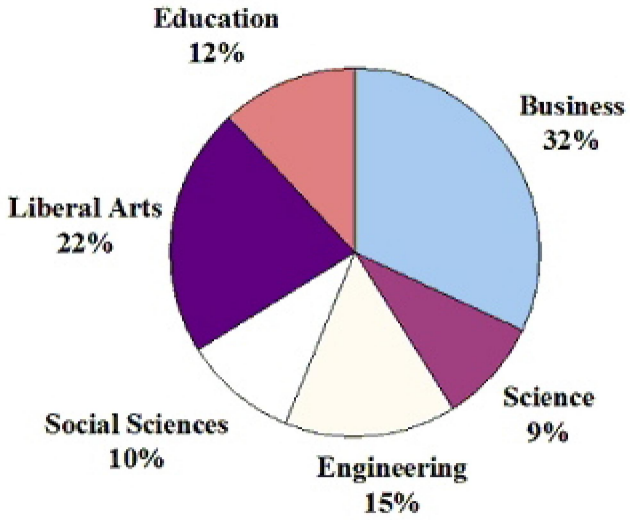
Construct a pie chart for the following distribution:

| Major | Number of Students |
|---|---|
| Business | 64 |
| Science | 18 |
| Engineering | 30 |
| Social Sciences | 20 |
| Liberal Arts | 44 |
| Education | 24 |

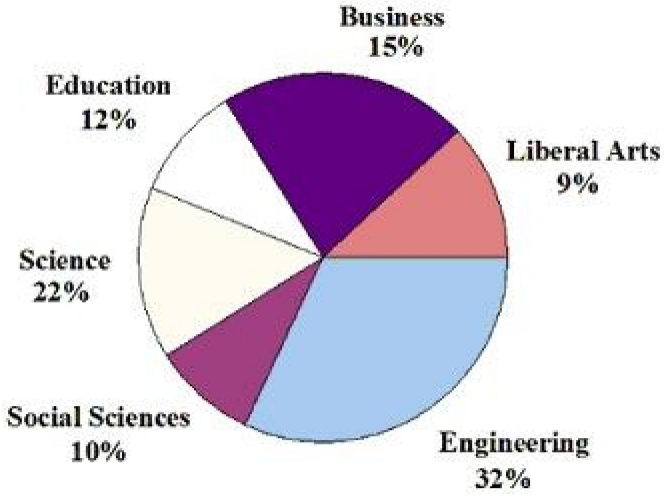
A)



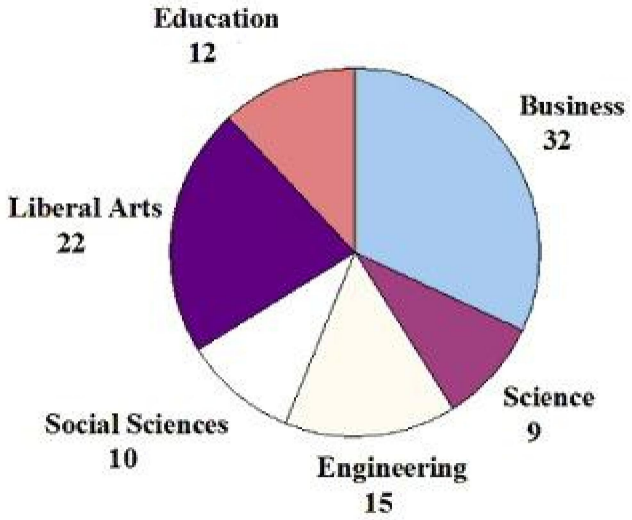
B)




C)



D)

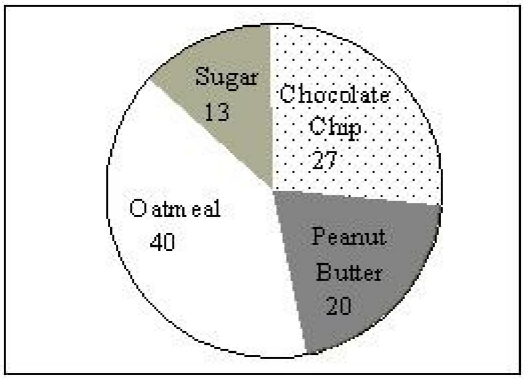



Answer: B

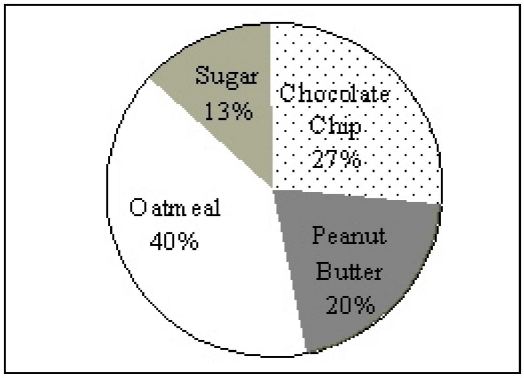
Construct a pie graph using the following data from a local bakery.

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

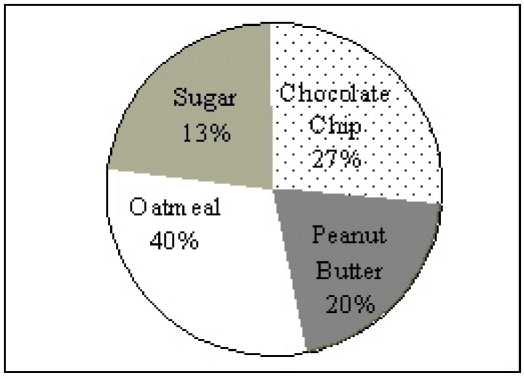
A)



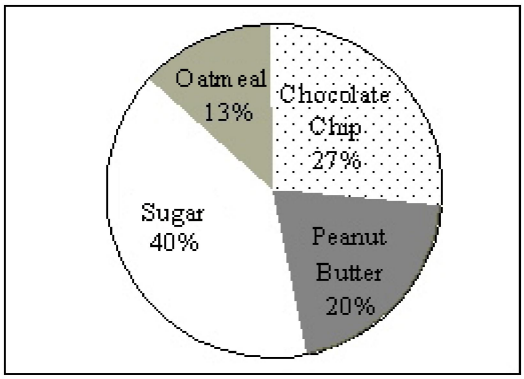
B)




C)




D)




Answer: B

A pie graph is <u>not</u> useful in showing which of the following characteristics of a data set?

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

Answer: C

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

A) True
B) False

Answer: B

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

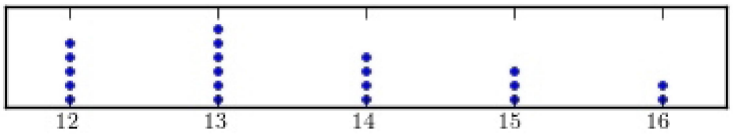
A) line
B) bar
C) pie
D) Pareto

Answer: C

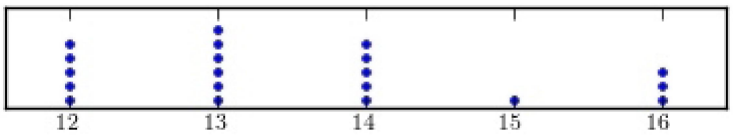
Construct a dotplot for the following data.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 16 | 13 | 14 | 12 | 15 | 13 | 14 | 14 | 12 | 12 |
| 14 | 13 | 13 | 14 | 12 | 13 | 15 | 14 | 12 | 16 |

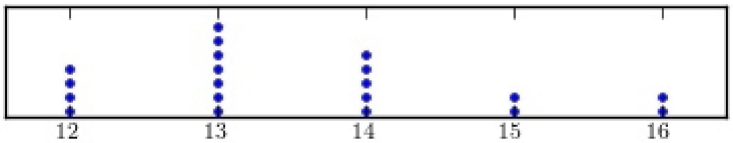
A)



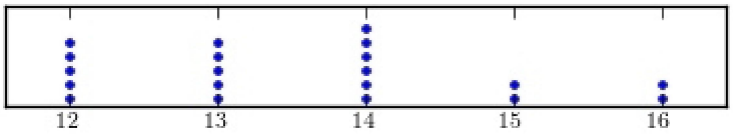

B)




C)



D)

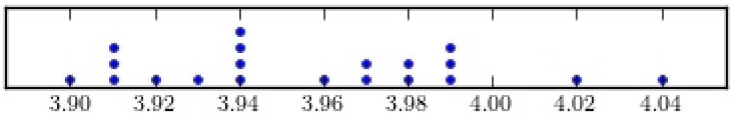



Answer: D

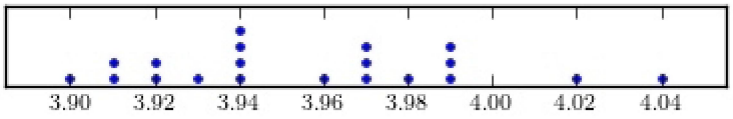
Construct a dotplot for the following data.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3.99 | 4.02 | 3.97 | 3.94 | 3.94 | 3.92 | 3.91 | 3.91 | 3.91 | 4.04 |
| 3.98 | 3.94 | 3.96 | 3.97 | 3.94 | 3.99 | 3.93 | 3.90 | 3.97 | 3.99 |

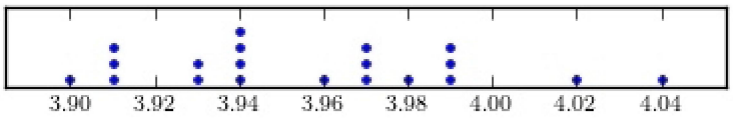
A)



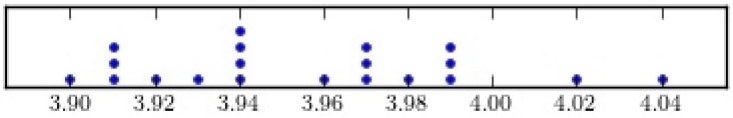

B)




C)




D)

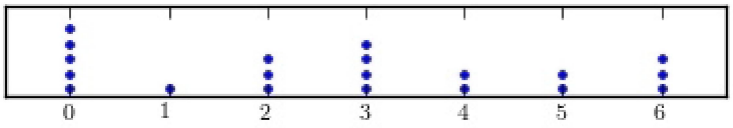



Answer: D

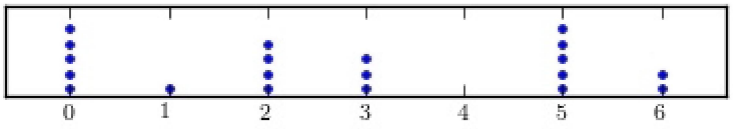
Following are the numbers of Dean's List students in a random sample of 20 university courses. Construct a dotplot for these data.

| | | | | |
|---|---|---|---|---|
| 0 | 1 | 0 | 3 | 3 |
| 2 | 5 | 5 | 0 | 2 |
| 3 | 5 | 6 | 0 | 3 |
| 4 | 5 | 2 | 6 | 0 |

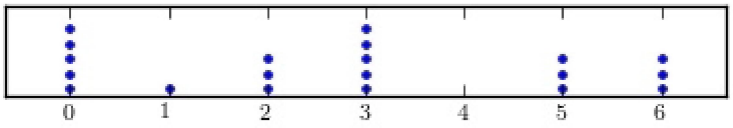
A)



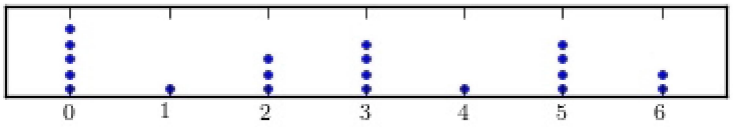

B)




C)




D)




Answer: D

The scores on a recent statistics exam are shown below. Construct a stem and leaf plot for the data.
98, 73, 64, 69, 86, 89, 77, 86, 91, 73

A)

| | |
|---|---|
| 1 | 9 |
| 2 | |
| 3 | 7 7 |
| 4 | 6 |
| 5 | |
| 6 | 8 8 |
| 7 | 7 |
| 8 | 9 |
| 9 | 6 8 |

B)

| | |
|---|---|
| 6 | 4 9 |
| 7 | 3 3 7 |
| 8 | 6 6 9 |
| 9 | 1 8 |

C)

| | |
|---|---|
| 1 | 9 |
| 2 | 0 |
| 3 | 7 7 |
| 4 | 6 |
| 5 | 0 |
| 6 | 8 8 |
| 7 | 7 |
| 8 | 9 |
| 9 | 6 8 |

D)

| | |
|---|---|
| 6 | 4 9 |
| 7 | 3 7 3 |
| 8 | 6 9 6 |
| 9 | 8 1 |

Answer: B

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

A)

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

B)

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

C)

| | | |
|---|---|---|
| 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 |

D)

| | | |
|---|---|---|
| 2 | 1 | 3, 6, 8 |
| 7, 6, 4, 2, 2 | 2 | 3, 3, 8 |
| 9, 5, 4, 1 | 3 | 1, 6, 7 |
| 9 | 4 | 5 |

Answer: C

Construct a stem-and-leaf plot for the following data.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 28 | 20 | 54 | 52 | 26 | 17 | 31 | 53 | 40 | 20 |
| 51 | 20 | 28 | 58 | 40 | 10 | 25 | 43 | 40 | 54 |

A)

| | |
|---|---|
| 1 | 07 |
| 2 | 0005688 |
| 3 | 1 |
| 4 | 000 |
| 5 | 1233448 |

B)

| | |
|---|---|
| 1 | 07 |
| 2 | 0005688 |
| 3 | 1 |
| 4 | 0003 |
| 5 | 13448 |
| 6 | 2 |

C)

| | |
|---|---|
| 1 | 07 |
| 2 | 000568 |
| 3 | 18 |
| 4 | 0003 |
| 5 | 123448 |

D)

| | |
|---|---|
| 1 | 07 |
| 2 | 0005688 |
| 3 | 1 |
| 4 | 0003 |
| 5 | 123448 |

Answer: D

Construct a stem-and-leaf plot for the following data, in which the leaf represents the tenths place.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 8.2 | 5.6 | 7.8 | 10.7 | 5.5 | 9.6 | 10.4 | 9.5 | 10.0 | 5.1 | 6.4 | 7.4 |
| 6.5 | 3.1 | 10.6 | 10.2 | 6.3 | 7.1 | 10.5 | 10.0 | 10.1 | 9.8 | 6.4 | 5.6 |

A)

| | |
|---|---|
| 2 | 1 |
| 3 | |
| 4 | |
| 5 | 566 |
| 6 | 13445 |
| 7 | 148 |
| 8 | 2 |
| 9 | 568 |
| 10 | 00124567 |

B)

| | |
|---|---|
| 3 | 1 |
| 4 | |
| 5 | 1566 |
| 6 | 3445 |
| 7 | 148 |
| 8 | 2 |
| 9 | 468 |
| 10 | 00125567 |

C)

| | |
|---|---|
| 3 | 1 |
| 4 | |
| 5 | 1566 |
| 6 | 3445 |
| 7 | 148 |
| 8 | 2 |
| 9 | 568 |
| 10 | 00124567 |

D)

| | |
|---|---|
| 3 | 1 |
| 4 | |
| 5 | 1566 |
| 6 | 3445 |
| 7 | 148 |
| 8 | 2 |
| 9 | 2568 |
| 10 | 004567 |
| 11 | 1 |

Answer: C

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.

A) True
B) False

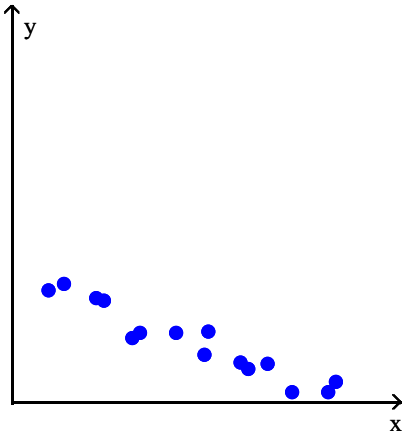
Answer: A

The two variables in a scatter plot are called the

A) spread and pattern.
B) lines and points.
C) independent variable and dependent variable.
D) relative frequency and relative proportion.

Answer: C

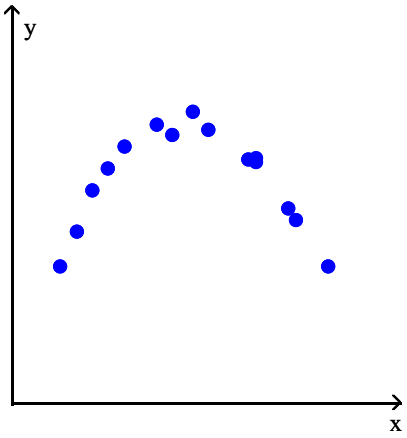
Examine the scatter plot and identify the type of relationship, if any, that corresponds to the graph.




A) Nonlinear relationship
B) No relationship
C) Positive linear relationship
D) Negative linear relationship

Answer: D

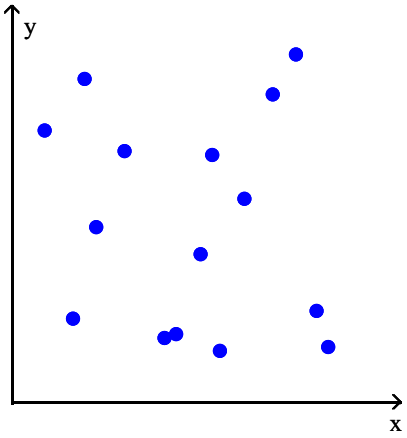
Examine the scatter plot and identify the type of relationship, if any, that corresponds to the graph.




A) No relationship
B) Nonlinear relationship
C) Positive linear relationship
D) Negative linear relationship

Answer: B

Examine the scatter plot and identify the type of relationship, if any, that corresponds to the graph.




A) Nonlinear relationship
B) Positive linear relationship
C) No relationship
D) Negative linear relationship

Answer: C

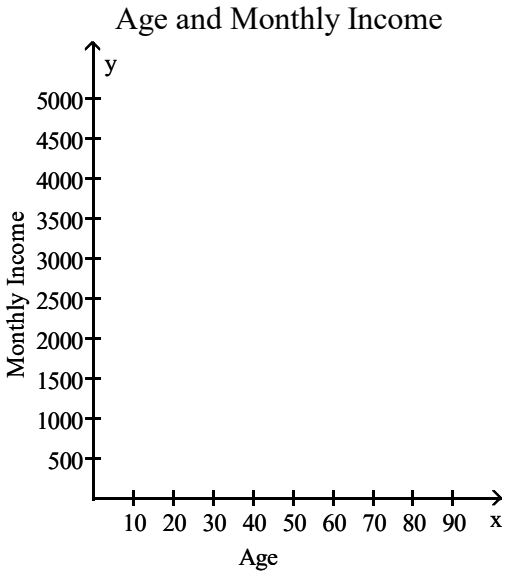
**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

A researcher wishes to determine whether a person's income is related to the person's age.

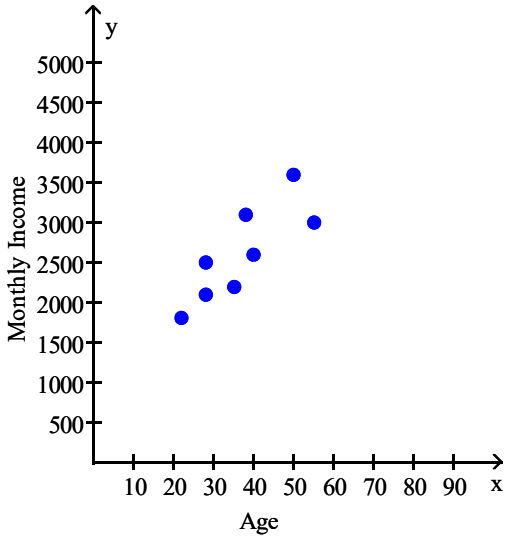
**a)** Draw a scatter plot.

**b)** Comment on the nature of the relationship.

| Age, $x$ | 28 | 50 | 38 | 28 | 40 | 35 | 55 | 22 |
|---|---|---|---|---|---|---|---|---|
| Income, $y$ | 2500 | 3600 | 3100 | 2100 | 2600 | 2200 | 3000 | 1800 |




Answer: **a)**



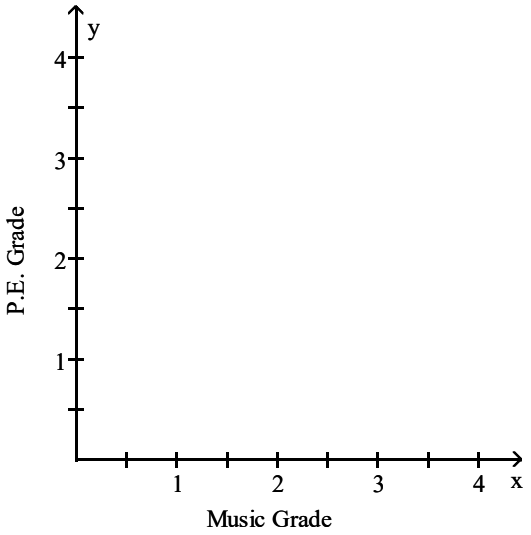

**b)** There appears to be a positive linear relationship between a person's income and their age.

A music instructor wishes to determine if a relationship exists between the grades of students who took an introductory music course and the grades of the same students who took a physical education course.

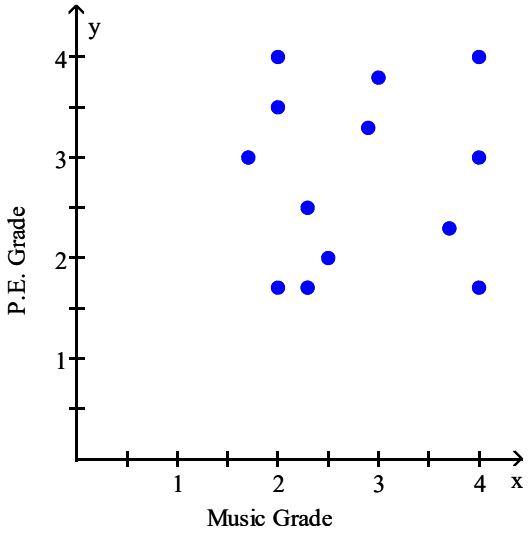
**a)** Draw a scatter plot.

**b)** Comment on the nature of the relationship.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Music, $x$ | 2.9 | 2.0 | 3.7 | 4.0 | 2.3 | 2.0 | 1.7 | 4.0 | 2.0 | 2.5 | 3.0 | 2.3 | 4.0 |
| Physical Ed., $y$ | 3.3 | 4.0 | 2.3 | 4.0 | 1.7 | 1.7 | 3.0 | 1.7 | 3.5 | 2.0 | 3.8 | 2.5 | 3.0 |




Answer: **a)**




**b)** There appears to be no linear relationship between the grades in Music and Physical education.

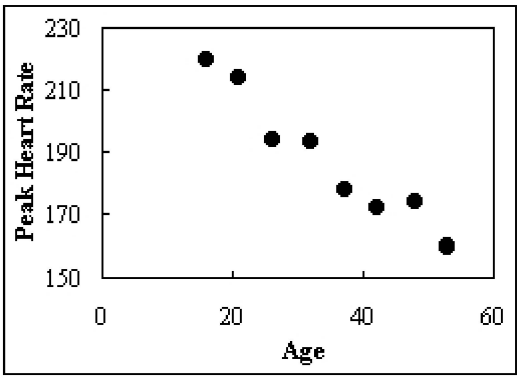
A study was conducted to determine if there was a linear relationship between a person's age and his/her peak heart rate.

**a)** Draw the scatter plot for the variables.

**b)** Give a brief explanation of the type of relationship.

| Age, $x$ | Peak Heart Rate, $y$ |
|---|---|
| 16 | 220 |
| 26 | 194 |
| 32 | 193 |
| 37 | 178 |
| 42 | 172 |
| 53 | 160 |
| 48 | 174 |
| 21 | 214 |

Answer: **a)**




**b)** There appears to be a negative linear relationship between age and peak heart rate.