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

The exercise presents numerical information. Describe the population whose properties are analyzed by the data.

1) There were 531 crimes in a certain city per 100,000 residents.

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

Solve the problem.

2) The city council of a small town needs to determine if the town’s residents will support the building of a new library. The council decides to conduct a survey of a sample of the town’s residents. Which one of the following procedures would be most appropriate for obtaining a sample of the town’s residents?

A) Survey 400 individuals who are randomly selected from a list of all people living in the state in which the town is located.
B) Survey every 10th person who enters the old library on a given day.
C) Survey a random sample of persons within each neighborhood of the town.
D) Survey a random sample of librarians who live in the town.

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

3) A random sample of 30 high school students is selected. Each student is asked how much time he or she spent watching television during the previous week. The following times (in hours) are obtained:

11, 19, 13, 16, 13, 11, 13, 12, 10, 16, 14, 12, 12, 11, 14, 13, 10, 10, 15, 12, 10, 12, 19, 14, 11, 15, 11, 14, 13, 12

Construct a frequency distribution for the data.

4) The ages of 30 swimmers who participated in a swim meet are as follows:


Construct a grouped frequency distribution for the data. Use the classes 19 - 28, 29 - 38, 39 - 48, 49 - 58, 59 - 68.
5) Construct a histogram and a frequency polygon for the given data.

<table>
<thead>
<tr>
<th>Years of Education Beyond High School</th>
<th>Number of People (thousands)</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>23</td>
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<tr>
<td>2</td>
<td>13</td>
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<td>2</td>
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</table>

6) A random sample of 30 attorneys is selected. The following list gives their ages:

30, 58, 42, 45, 55, 63, 52, 41, 29, 35, 43, 31, 61, 44, 60, 32, 29, 39, 44, 51, 38, 31, 48, 53, 67, 54, 30, 53, 72, 71

Construct a stem-and-leaf plot for the data. What does the shape of the display reveal about the ages of the attorneys?

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

7) Which one of the following is true according to the graph?

A) If the sample is truly representative, then for a group of 50 people, we can expect about 32 of them to have one year of education beyond high school.
B) The graph is based on a sample of approximately 62 thousand people.
C) More people had 4 years of education beyond high school than 3 years.
D) The percent of people with years of higher education greater than those shown by any rectangular bar is equal to the percent of people with years of education less than those shown by that bar.
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Find the mean for the data items in the given frequency distribution. Round to the nearest hundredth, if necessary.

<table>
<thead>
<tr>
<th>Score</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>x</td>
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<td>9</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

Find the mean for the group of data items. Round to the nearest hundredth, if necessary.

9) Six people from different occupations were interviewed for a survey, and their annual salaries were as follows: $12,000, $20,000, $25,000, $37,000, $67,500 and $125,000. What is the mean annual salary for the six people?

Find the median for the group of data items.

10) 5.4, 5.9, 7.4, 9.1, 5.4, 9, 5.4, 2, 2, 3.2

Find the mode for the group of data items. If there is no mode, so state.

11) 95, 95, 90, 42, 71, 95

12) 1.1, 2.3, 1.5, 2.7, 1.1, 2.3, 1.1, 9.1, 9.1, 1.8

Find the midrange for the group of data items.

13) 97, 97, 94, 47, 71, 97

For the given data set, find the a. mean b. median c. mode (or state that there is no mode) d. midrange.

14) Ages of teachers in the mathematics department of a certain high school:

25, 55, 38, 60, 25, 55, 25, 47, 47, 41

Find the midrange for the group of data items.

15) 1.4, 2.1, 1.6, 2.5, 1.4, 2.1, 1.4, 9.5, 9.5, 2

Find the range for the group of data items.

16) 11, 12, 13, 14, 15
Find the standard deviation for the group of data items.

17) 11, 18, 11, 18, 11, 18, 11, 18

Compute the mean, range, and standard deviation for the data items in each of the three samples. Then name one way in which the samples are alike and one way in which they are different.

18) Sample A: 11, 13, 15, 17, 19, 21, 23
Sample B: 11, 14, 14, 17, 20, 20, 23
Sample C: 11, 11, 17, 23, 23, 23

Find a. the mean b. the deviation from the mean for each data item: and c. the sum of the deviations in part b.

19) 150, 157, 159, 164, 165

Provide an appropriate response.

20) True or False? In a normal distribution, as the sample size increases, so does the graph’s symmetry.

21) In a normal distribution, approximately what percent of data items fall within 1 standard deviation of the mean (in both directions)?

22) If an adult male is told that his height is 3 standard deviations above the mean of the normal distribution of heights of adult males, what can he assume?

The scores on a driver's test are normally distributed with a mean of 100. Find the score that is:

23) Find the score that is $2\frac{1}{2}$ standard deviations above the mean, if the standard deviation is 30.
Solve the problem.

24) The histogram shows the ages (in months) that babies learned to walk. Use this histogram to solve the problem.

(i) Find the median age that a baby learned to walk.
(ii) Find the third quartile by determining the median of the upper half of the data.

25) A survey was conducted of 371 teenagers. Thirty-five percent of the teenagers said they occasionally smoked cigarettes. a. Find the margin of error for this survey. b. Write a statement about the percentage of teenagers who occasionally smoke cigarettes.

A set of data items is normally distributed with a mean of 60. Convert the data item to a z-score, if the standard deviation is as given.

26) data item: 78; standard deviation: 12
1) residents of the city
2) C
3) 

<table>
<thead>
<tr>
<th>Hours of TV</th>
<th>Number of HS Students</th>
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<tbody>
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<td>10</td>
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<td>16</td>
<td>2</td>
</tr>
<tr>
<td>19</td>
<td>2</td>
</tr>
</tbody>
</table>

Age | Number of Swimmers
---|-------------------
19 - 28 | 10
29 - 38 | 8
39 - 48 | 5
49 - 58 | 5
59 - 68 | 2

4) The ages tend to be concentrated in the middle of the range.

5) 

6) 

<table>
<thead>
<tr>
<th>Stems</th>
<th>Attorneys</th>
</tr>
</thead>
<tbody>
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<td>12</td>
</tr>
</tbody>
</table>

The ages tend to be concentrated in the middle of the range.

7) C
8) 6.62
9) $47,750
10) 5.48
11) 92.5
12) 2.05
13) 97
14) a. 41.8
   b. 44
   c. 25
   d. 42.5
15) 5.45
16) 4
17) \( \frac{7\sqrt{2}}{\sqrt{7}} \)
18) Mean (for A, B and C): 17 Range (for A, B, and C): 12 Standard deviation: (A) 4.32 (B) 4.24 (C) 6. Samples have the same mean but different standard deviations.
19) a. 159 b. -9, -2, 0, 5, 6 c. 0
20) True
21) 68%
22) He is taller than about 99.7% of the other men whose heights were measured.
23) 175
24) (i) median = 12;
   (ii) third quartile = 13
25) a. ±5.2% b. There is a 95% probability that the true population percentage lies between 29.8% and 40.2%.
26) 1.5