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$\qquad$

1 Put the data in order from least to greatest. Then find the values of the 30th and 90th percentiles of the data.
$129,113,200,100,105,132,100,176,146,152$
A

$$
\text { 30th percentile }=105
$$

90th percentile $=200$
B 30th percentile $=113$;
90th percentile $=200$
C 30th percentile $=105$;
90th percentile $=176$
D 30th percentile $=113$;
90 th percentile $=176$

2 Which set of values has range $=3$, mean $=10$, and mode $=11$ ?
A $3,4,5,6,7,8,9,10,11$
B $8,11,11$
C $3,10,11$
D $9,10,11,11,11,12,12$

3 A restaurant chain's owners are trying to decide if they want to open up a franchise in your town. To help them decide, they want to find out how often people in your town go out to eat. A researcher interviews people leaving a local restaurant. Is there a bias in this sampling method? Explain.

Yes; the survey would likely miss people who eat out infrequently or not at all.
A People leaving a restaurant are likely to eat out more often than the general population.
B No; the survey doesn't have a bias because the people being interviewed are selected completely at random.

4 Identify the type of sampling method used.
A trucking company places a card with their office phone number on the door step of every home within 5 miles of their office.

A systematic
B random
C convenience
D self-selected

5 The bar graph shows the rents paid per month for apartments in an urban neighborhood. The curve shows that the rents are normally distributed.


Estimate the percent of apartment residents who pay from $\$ 600$ to $\$ 749$ per month.
A $93 \%$
B 68\%
C $43 \%$
D $25 \%$

6 The bar graph shows the rents paid per month for apartments in an urban neighborhood. The curve shows that the rents are normally distributed.


Estimate the percent of apartment residents who pay from $\$ 700$ to $\$ 749$ per month.
A $68 \%$
B 3\%
C $25 \%$
D 93\%
$7 \quad$ A sample space is normally distributed as shown in the graph. What is the probability that a sample is less than 54 given that it is greater than 50 ?


A $50 \%$
B $34 \%$
C $95 \%$
D $47.5 \%$

8 Is there any bias in the survey questions below? What is a good explanation for your answers?
a. What do think would help students pay more attention in class?
b. Should a state have the power to kill a person for breaking the law?
a. No, there is no bias because it was not a loaded question, it was not a leading question, and it did not combine two or more issues.
b. Yes. Answers may vary. Sample: There is bias because the question is loaded. Using the word "kill" instead of "capital punishment" could cause a reaction from respondents.
a. No, there is no bias because it was not a loaded question, it was not a leading question, and it did not combine two or more issues.
A b. Yes, there is bias because the question appears to influence a particular response by using the word "kill" instead of "capital punishment".
a. Yes, there is bias because the question appears to influence a particular response by assuming the students need help or that they do not pay attention.
b. No, there is no bias because it was not a loaded question, it was not a leading question, and it did not combine two or more issues.
a. Yes, there is bias because the question appears to combine two issues: the

C students needing help and that they do not pay attention.
b. Yes, there is bias because the question appears to influence a particular response by using the word "kill" instead of "capital punishment".

9 Over the first five years of owning her car, Luna drove about 12,700 miles the first year, 15,478 miles the second year, 12,675 the third year, 11,850 the fourth year, and 13,075 the fifth year.
Find the mean, median, and mode of this data; explain which measure of central tendency will best predict how many miles Gina will drive in the sixth year.

A
mean $=12,700$; median 13,156 ; no mode; the mean is the best choice because it is representative of the entire data set.
B
mean = 13,156; median 12,700 ; mode $=3,628$; the median is the best choice because it is not skewed by the high outlier.
C mean = 13,156; median 12,700; no mode; the mean is the best choice because it is representative of the entire data set.
D mean $=13,156$; median 12,700; no mode; the median is the best choice because it is not skewed by the high outlier.

10 Which value is the outlier in this data set?
$3.4,4.8,3.1,0.2,6.9,5.5,6.6,5.1$
A 3.1
B 0.2
C 5.1
D 6.6

11 What are the mean, variance, and standard deviation of these values? Round to the nearest tenth.
$1,9,4,12,13,13$
A mean = 10.5
A variance $=2.2$ standard deviation $=4.6$ mean $=8.7$
B variance $=21.6$ standard deviation $=4.6$ mean $=10.5$
C variance $=21.6$ standard deviation $=5.1$ mean $=8.7$
D variance $=2.2$ standard deviation $=5.1$

12 What are the mean, variance, and standard deviation of these values? Round to the nearest tenth.

92, 97, 53, 90, 95, 98

$$
\text { mean }=93.5
$$

A variance $=245.6$ standard deviation $=17.2$ mean $=87.5$
B variance $=245.6$ standard deviation $=15.7$ mean $=87.5$
C variance $=4$ standard deviation $=15.7$ mean $=93.5$
D variance $=4$ standard deviation $=17.2$

13 The data show the heights (in cm ) of the flowers in a window box. Within how many standard deviations of the mean do the values fall?
$16,19,40,38,25,32$
A 2
B 1
C 3
D 4

14 Find the outlier in this data set:
$24,13,37,17,23,15,18,19$
A 13
B 19
C 23
D 37

15 Find the mean, median, and mode for this data set:
$10,3,13,15,2,15,10,1,1,1,1$
mean $=6$,
A median $=3$, mode $=1$ mean $=6$,
B median $=3$, mode $=8$ mean $=6.5$,
C median = 8, mode $=1$ mean $=6.5$
D median = 3 mode $=1$

16 Within how many standard deviations from their mean do all these values fall? $139,163,153,128,130,170,159,92,68,170,124,136$

A 3
B 1
C 5
D 2

17 Within how many standard deviations from their mean do all these values fall? $61,71,130,103,136,155,146,92,79,162,162,123$

A 1
B 2
C 3
D 4

18 The scores on an exam are normally distributed, with a mean of 75 and a standard deviation of 5 . What percent of the scores are less than 80 ?

A $50 \%$
B $84 \%$
C $13.5 \%$
D $16 \%$

19 The numbers of cookies in a shipment of bags are normally distributed, with a mean of 51 and a standard deviation of 2 . What percent of the bags will contain between 47 and 55 cookies?

A $16 \%$
B $2.5 \%$
C $47.5 \%$
D 95\%

20 Researchers ask every 10th person entering a mall what sort of pet they prefer. Which type of study is described in this situation?

A controlled experiment
B observational study
C survey
D documentary research

