

Name Key
Date / /

Determine whether the data set is a population or a sample.

- 1) The age of every fourth person entering a department store

sample

$$\frac{120}{120}$$

Identify the population and the sample.

- (2) 2) When 1886 American households were surveyed, it was found that 85% of them owned two cars.

Sample: The 1886 American households surveyed,

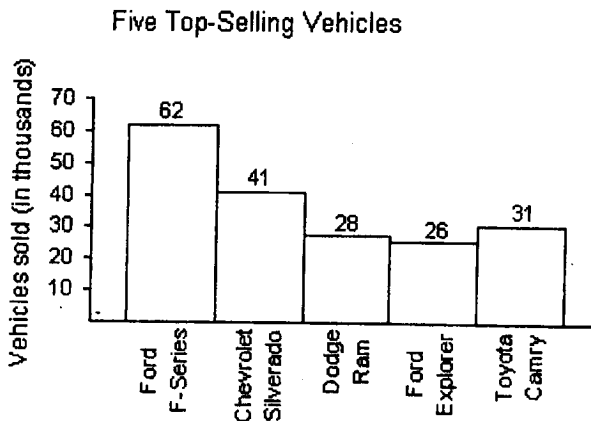
Population: All American households

For problems 3 and 4, identify the data set's level of measurement.

- (2) 3) the ratings of a movie ranging from "poor" to "good" to "excellent"

Ordinal

- (2) 4) the data listed on the horizontal axis in the graph



Nominal

Provide an appropriate response.

- (2) 5) A report sponsored by the California Citrus Commission stated that cholesterol levels can be lowered by drinking at least one glass of a citrus product each day. Determine if the report is biased and explain why.

Biased, The CCC is likely to make positive claims in their favor.

For problems 6 and 7, identify the sampling technique used.

- (2) 6) Every fifth person boarding a plane is searched thoroughly.

Systematic

- (2) 7) A community college student interviews everyone in a statistics class to determine the percentage of students that own a car.

Convenience

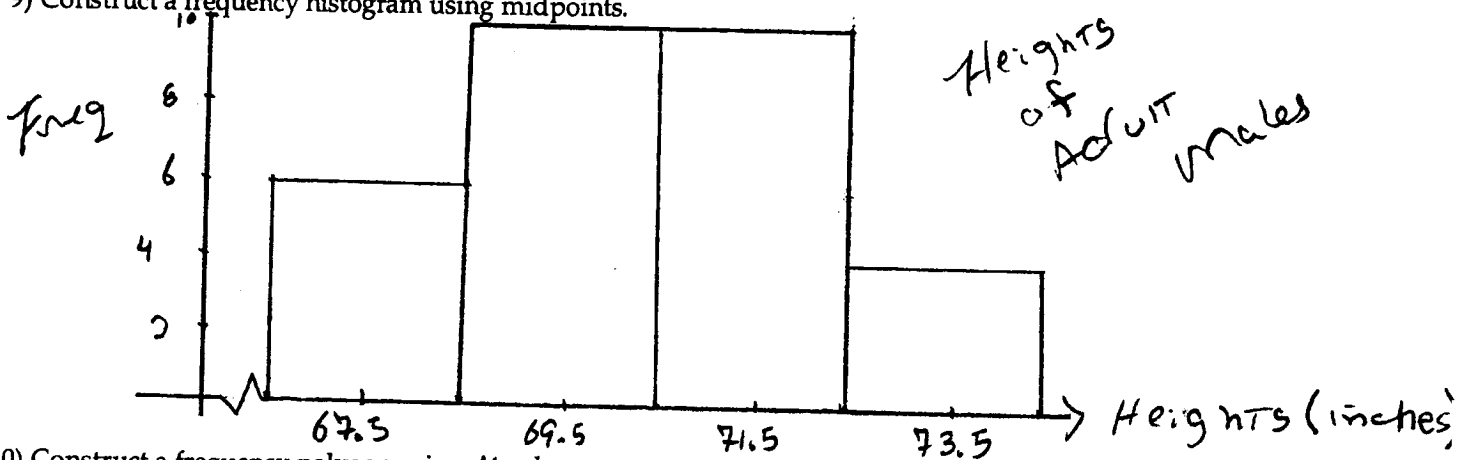
The heights (in inches) of 30 adult males are listed below.

~~70~~ ~~72~~ ~~71~~ ~~70~~ ~~69~~ ~~72~~ ~~69~~ ~~70~~ ~~71~~ ~~71~~ ~~72~~
~~69~~ ~~72~~ ~~71~~ ~~70~~ ~~69~~ ~~72~~ ~~69~~ ~~70~~ ~~71~~ ~~71~~ ~~72~~
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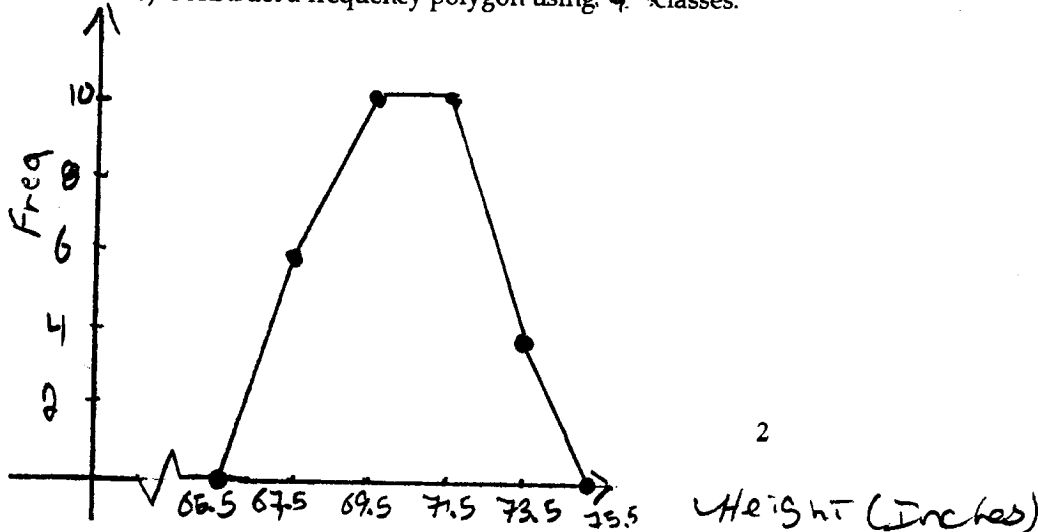
(10) 8) Construct a frequency distribution including class limits, frequencies, midpoints, boundaries, relative frequencies, and cumulative frequencies, using five classes.

Class Limits	Frequencies	Midpoints	Boundaries	Relative Frequencies	Cumulative Frequencies
67-68	6	67.5	66.5-68.5	.20	6
69-70	10	69.5	68.5-70.5	.33	16
71-72	10	71.5	70.5-72.5	.33	26
73-74	4	73.5	72.5-74.5	.13	30

(10) 9) Construct a frequency histogram using midpoints.



(10) 10) Construct a frequency polygon using 4 classes.

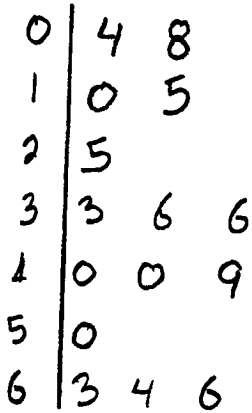


Provide an appropriate response.

- (10) 11) The numbers of home runs that Sammy Sosa hit in the first 15 years of his major league baseball career are listed below. Make a stem-and-leaf plot for this data. What can you conclude about the data?

4 15 10 8 33 25 36 40 36 66 63 50 64 49 40

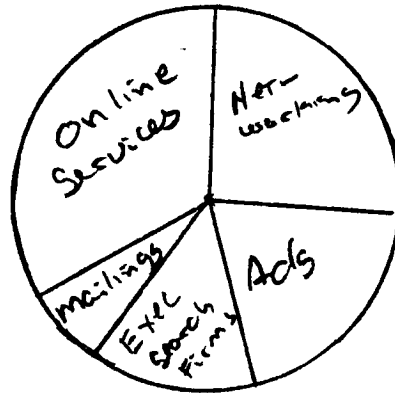
Key $3/6 = 36$



mostly hit homeruns
in the 30's - 40's.

- (10) 12) A study was conducted to determine how people get jobs. Four hundred subjects were randomly selected and the results are listed below.

Job Sources of Survey Respondents	Frequency
Newspaper want ads	69
Online services	124
Executive search firms	72
Mailings	32
Networking	103



$$\frac{69}{400} \cdot 360^\circ = 62^\circ$$

$$\frac{124}{400} = 112^\circ$$

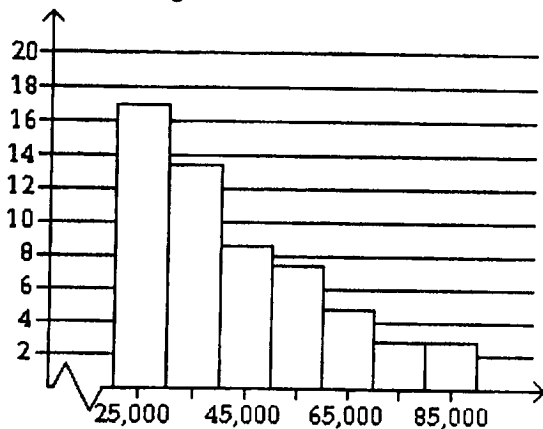
$$\frac{72}{400} = 65^\circ$$

$$\frac{32}{400} = 29^\circ$$

$$\frac{103}{400} = 93^\circ$$

Construct a pie chart of the data.

- (12) 13) Determine whether the approximate shape of the distribution in the histogram is symmetric, uniform, skewed left, skewed right, or none of these.



Skewed right

- (6) 14) Find the mean, median, and mode of the following numbers:

65 68 61 65 58 66 65 59 60 63

Mean: = 63

Median: = 64

Mode: = 65

- (4) 15) On a recent Statistics test, the scores were 15, 66, 66, 81, 82, 83, 85, 88, 90, 92, 93, and 95. Is the mean a good representation of the center of data? If not, why?

No, outlier of 15.

- (10) 16) Find the sample standard deviation by hand.

22 29 21 24 27 28 25 36

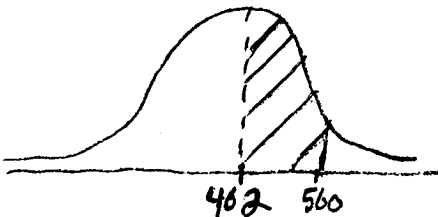
$$\bar{x} = 26.5$$

x	$x - \bar{x}$	$(x - \bar{x})^2$
22	-4.5	20.25
29	2.5	6.25
21	-5.5	30.25
24	-2.5	6.25
27	.5	.25
28	1.5	2.25
25	-1.5	2.25
36	9.5	90.25

$$\Sigma = 158$$

$$SD = \sqrt{\frac{158}{7}} = 4.75$$

- (4) 17) The mean SAT verbal score is 462, with a standard deviation of 98. Use the Empirical Rule to determine what percent of the scores lie between 462 and 560. (Assume the data set has a bell-shaped distribution.)



$\Rightarrow 34\%$

- (6) 18) Heights of adult women have a mean of 63.6 in. and a standard deviation of 2.5 in. Apply Chebyshev's Theorem to the data using $k = 3$. Interpret the results.

$$k=3 \Rightarrow 1 - \frac{1}{9} = 88.9$$

$$63.6 \pm 2.5(3) = 56.1 \text{ and } 71.1$$

Thus, CT \Rightarrow At least 88.9% of adult women have heights between 56.1" and 71.1"

Find the coefficient of variation for each of the two sets of data, then compare the variation. Round results to one decimal place.

19) Listed below are the systolic blood pressures (in mm Hg) for a sample of men aged 20-29 and for a sample of men aged 60-69.

Men aged 20-29: 118 124 129 118 131 123

Men aged 60-69: 131 151 137 125 164 139

$$CV_1 = \frac{5.419}{123.83} \cdot 100\% = 4.4\%$$

$$CV_2 = \frac{14.176}{141.17} \cdot 100\% = 10.0\%$$

Significantly more variation in systolic blood pressure for men aged 60-69 years.

Provide an appropriate response.

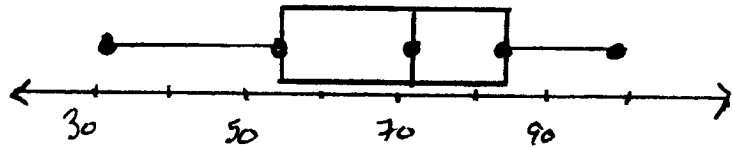
20) The test scores of 30 students are listed below. Draw a box-and-whisker plot that represents the data.

31 41 45 48 52 55 56 56 63 65

67 67 69 70 70 74 75 78 79 79

80 81 83 85 85 87 90 92 95 99

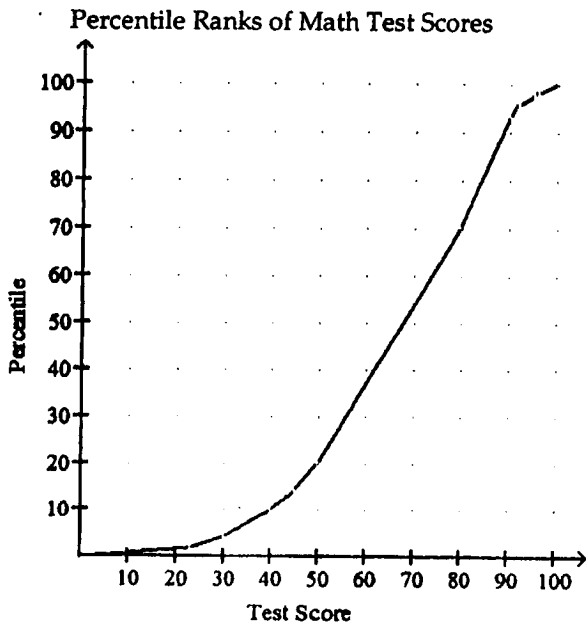
$L = 31$
 $Q_1 = 56$
 $med = 72$
 $Q_3 = 83$
 $m = 99$



21) Find the z-score for the value 62, when the mean is 79 and the standard deviation is 4.

$$z = \frac{62 - 79}{4} = -4.25$$

22) The graph below is an ogive of scores on a math test.



Use the graph to approximate the test score that corresponds to the 10th percentile?