

Advance Math  
UNIT 9 REVIEW

Name: Key  
Date: \_\_\_\_\_

Use the scenario to find the statistical information.

1) In order to gauge college students' opinions on the quality of the student union's food options, a research group surveyed 500 college students by stopping at every 10<sup>th</sup> dorm room at all dorms on campus. They discovered that 7 out of 10 students thought the student union's food was good.

Population: College students

Sample: 500 college students

Pop. Parameters: opinion on student union's food options

Sample Stats: 7 out of 10 like student union's food

What type of sampling method did they use here?

every 10<sup>th</sup> dorm = systematic sampling

2) A telephone poll used a computer program to randomly select 1200 phone numbers in America to survey people on their thoughts of the current state of health care in the country. 3 out of 10 people said they were satisfied with their current health care options.

Population: Americans

Sample: 1200 random Americans

Pop. Parameters: thoughts on current health care

Sample Stats: 3 out of 10 satisfied with health care

What type of sampling method did they use here?

computer program = simple random sampling

3) A magazine posted a survey in their most recent issue that asked readers about what websites they use most when they shop online. They asked readers to take the survey and mail it back to the magazine. The magazine received 125 surveys and determined the top 5 websites in common from all readers.

Population: magazine readers

Sample: 125 readers

Pop. Parameters: online shopping websites most used

Sample Stats: top 5 common sites used by readers

What type of sampling method did they use here?

convenience sampling

4) Which option below is the most representative sample for a study attempting to determine the average height and weight of students at a large university.

- Surveying students in the school's athletic program X bias
- Surveying students in the school's fine arts program X bias
- Surveying students who live in a single apartment complex on campus X bias
- Surveying students who walk through a common area on campus ✓

Identify the type of study that would be best for each research scenario by circling ONE word in each row. Then identify the elements of each.

5) Determining if taking a multivitamin every day during cold season helps prevent you from getting a cold.

Experiment

OR

Observation

No Blind

Single Blind

Double Blind

OR

Standard

Case-Control

Who is control group? those getting placebo

OR

Who is case group? \_\_\_\_\_

Who is treatment group? those getting vitamin

Who is control group? \_\_\_\_\_

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6) Determining if drinking alcohol while pregnant has effects on unborn child.

Experiment  
 No Blind      Single Blind      Double Blind  
 Who is control group? \_\_\_\_\_  
 Who is treatment group? \_\_\_\_\_

OR Observation  
 OR Standard Case-Control  
 OR Who is case group? data from those who drank  
 Who is control group? data from those who didn't

Find the confidence interval with the following data.

7) A survey concludes 72% of people approve of the current mayor, with a 5% margin of error.



8) A study shows that 43% of people who takes vitamins will avoid getting sick, with a 4% margin of error.



Use the frequency table to identify the type of data represented and them make a graph.

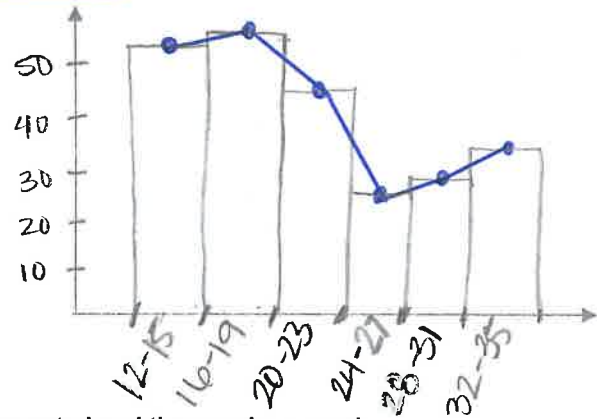
9) Rates of crimes determined by age group

Age	12 - 15	16 - 19	20 - 23	24 - <del>27</del>	28 - 31	32 - 35
Crime Frequency	52	53	43	26	28	33

a) Is this data QUALITATIVE or QUANTITATIVE

b) Make a histogram to the right

c) Make a line graph ON TOP OF the histogram



Use the frequency table to identify the type of data represented and them make a graph.

10) Amount of beef produced (in millions) by the top 5 beef-producing nations in the world.

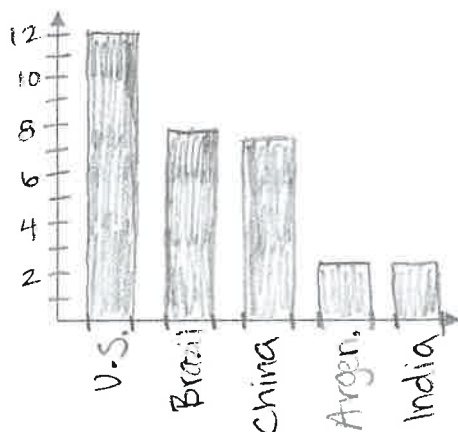
Country	U.S.	Brazil	China	Argentina	India
Amount of beef	12.0	7.9	7.6	2.8	2.8

= 33.1

a) Is this data QUALITATIVE or QUANTITATIVE

b) Make a bar graph

c) Make a pie chart (change to % first)



U.S. →  $\frac{12}{33.1} = 36\%$   
 Brazil →  $\frac{7.9}{33.1} = 24\%$   
 China →  $\frac{7.6}{33.1} = 23\%$   
 Arg →  $\frac{2.8}{33.1} = 8.5\%$   
 India →  $\frac{2.8}{33.1} = 8.5\%$   
100%

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Identify the type of correlation.

11) Rainfall and plant growth

positive

13) Ticket prices and ticket sales

negative

15) Temperature and amount of clothing worn

negative

17) Draw a scatterplot of a strong positive correlation



12) Salary and eye color

none

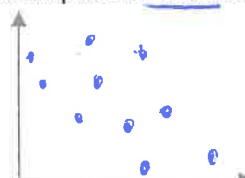
14) Speed and distance traveled

positive

16) Time spent exercising and weight

negative

18) Draw a scatterplot of a weak negative correlation



Find the mean, median, mode, and range of the data. Also use the RANGE RULE OF THUMB to find the standard deviation.

19) ~~13, 18, 13, 14, 13, 16, 14, 21, 13~~

13, 13, 13, 13, 14, 14, 16, 18, 21

Mean: 15    Mode: 13    S.D.: 2  
 Median: 14    Range: 8

20) 66, 74, 75, 78, 82, 89, 91, 91, 93

Mean: 82.1    Mode: 91    S.D.: 6.75  
 Median: 82    Range: 27

21) ~~78, 56, 68, 92, 84, 76, 74, 56, 68, 66, 78, 72, 66, 65, 53, 61, 62~~

~~53, 56, 56, 61, 62, 65, 66, 66, 68, 68, 72, 74, 76, 78, 78, 84, 92~~

Mean: 69.1    Median: 68    Mode: 56, 66, 68, 78    Range: 39    S.D.: 9.75

22) Compare the standard deviations from #19 – 21. Which problem had the lowest variation? Which problem has the highest variation?

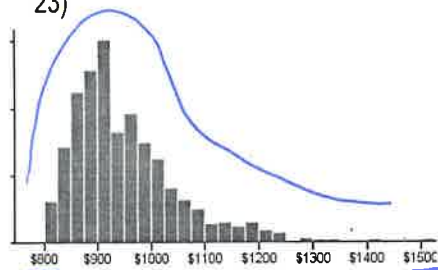
19) 2 lowest (thinnest)

20) 6.75

21) 9.75 highest (widest)

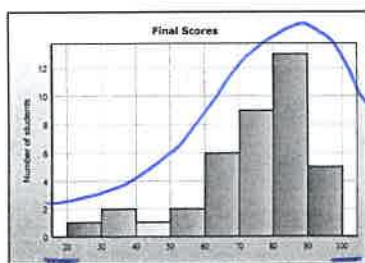
Characterize the histograms by stating: the number of peaks, whether it is skewed or symmetric, and the variation.

23)



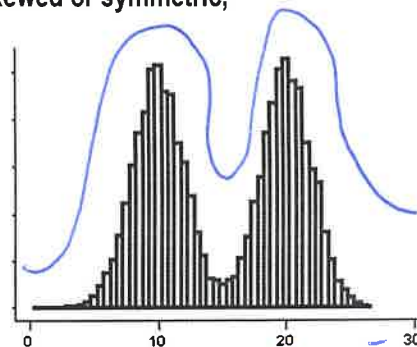
Single-Peak  
 Right-skewed  
 Moderate Variation  
 (\$800 - \$1500)

24)



Single Peak  
 Left-skewed  
 High Variation  
 (0-100)

25)



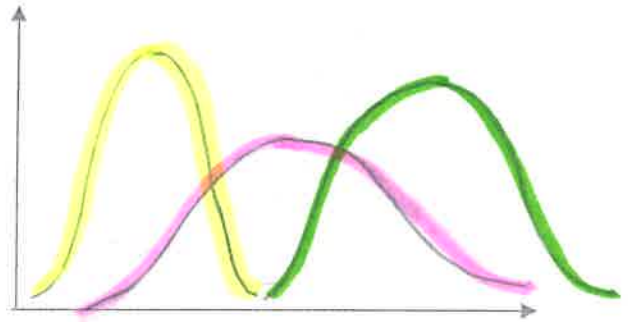
Double Peak  
 Symmetric  
 Low Variation  
 (0-28)

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26) Draw 3 different examples of a normal distribution on the graph. (they must all be slightly different, but should all still be normal distributions)



Use the table from your 9.9 notes to find the z-scores and their corresponding percentiles.

**The mean of all the test scores was 72, with a standard deviation of 5.**

27) Find the standard score (z-score) for a test score of 83. What percentile is that?

$$z = \frac{\text{value} - \text{mean}}{\text{S.D.}} = \frac{83 - 72}{5} = 2.2$$

$$z = 2.2, 98.61\%$$

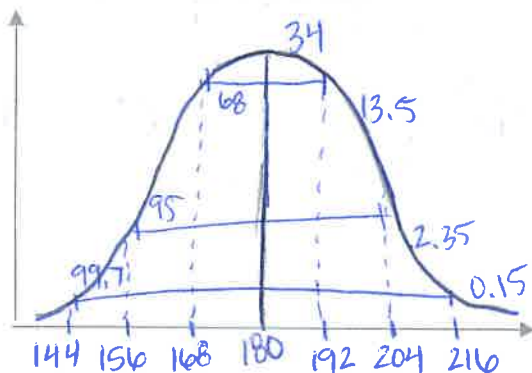
28) Find the standard score (z-score) for a test score of 62. What percentile is that?

$$z = \frac{62 - 72}{5} = -2$$

$$z = -2, 2.28\%$$

Use the scenarios and the 68-95-99.7 Rule to create a graph of the normal distribution and answer the questions.

29) The weight of all adult men is normally distributed with a mean of 180 pounds and a standard deviation of 12 pounds.



a) the z-score for a weight of 168 lbs  $z = -1$

b) percentile for a weight of 192 lbs  $z = 1$  about 84%

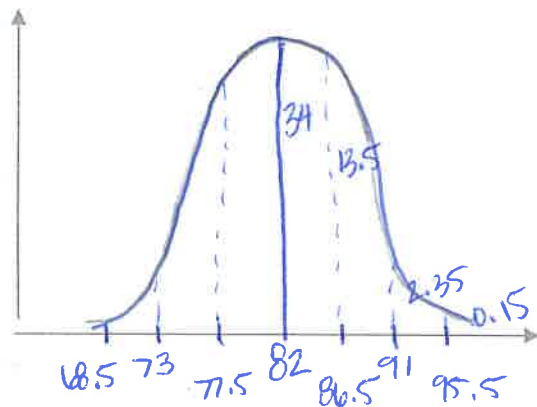
c) range of weights of 68% of people 168 - 192

d) percent of people weighing 168 - 180 lbs 34%

e) percent of people weighing more than 180 lbs 50%

f) range of weights of 95% of people 156 - 204

30) The grades in an Intro to Psychology class are normally distributed with a mean of 82 and a standard deviation of 4.5.



a) the z-score for a score of 92  $\frac{92 - 82}{4.5} = \frac{10}{4.5} = 2.2$

b) percentile for a score of 77.5  $z = -1$  about 16%

c) range of scores for 99.7% of people 68.5 - 95.5

d) percent of people scoring higher than 91 2.5%

e) percent of people scoring less than 77.5 16%

f) range of weights of 68% of people Scores 77.5 - 86.5