Math 54 **Test #1** **Name** Neve Rosa

100

Show all work neatly and systematically for full credit. Total points: 102

(4) Determine whether the given value is a statistic or a parameter.

1) a. Only 12 men have walked on the moon. The average time these men spent on the moon was 43.92 hours.

parameter ✓

b. Interviews of 100 adults 18 years of age or older, conducted nationwide, found that 44% could state the minimum age required for the office of U.S. president.

Statistic ✓

(4) Determine whether the given value is from a discrete or continuous data set.

2) a. The volume of water lost each day through a leaky faucet.

continous ✓

b. Internet connection speed in kilobytes per second.

-2. discret ✗

(6) Determine which of the four levels of measurement (nominal, ordinal, interval, ratio) is most appropriate.

3) a. Volume of water used by a household in a day.

ratio ✓

b. Eye color.

nominal ✓

c. Time of day measured in military time.

interval ✓

(3) Determine whether the given description corresponds to an observational study or an experiment.

4) Seventh-grade students are randomly divided into two groups. One group is taught math using tradictional techniques; the other is taught math using a reform method. After 1 year, each group is given an achievement test to compare proficiency.

experiment ✓

(6) Identify which of these types of sampling is used: random, stratified, systematic, cluster, convenience.

5) a. A radio station asks its listeners to call in their opinion regarding the use of U.S. ofrces in peacekeeping missions.

Convenience ✓

b. A quality-control manager at Intel selects every 8th chip that comes off the assesmbly line starting with the 3rd until she obtains a smaple of 140 chips.

Systematic ✓

c. To determine customer opinion of its boarding policy, Southwest Airlines randomly selects 60 flights during a certain week and survey all passengers on the flights.

Cluster ✓

-2

(3) Identify the type of observational study (cross-sectional, retrospective, prospective).

6) A statistical analyst obtains data about ankle injuries by examining a hospital's records from the past 3 years.

retrospective ✓

Provide an appropriate response.

7) (2, 2, 2, 3, 4) The following frequency distribution analyzes the time (in minutes) it takes students to finish a quiz.

Time	Number of students	midpoints	class boundries	f · midpoints
8.0 – 8.9	2	8.45	7.95 – 8.95	2(8.45) = 16.9
9.0 – 9.9	4	9.45	8.95 – 9.95	4(9.45) = 37.8
10.0 – 10.9	1	10.45	9.95 – 10.95	1(10.45 = 10.45
11.0 – 11.9	6	11.45	10.95 – 11.95	6(11.45) = 68.7
12.0 – 12.9	1	12.45 ✓	11.95 – 12.95	1(12.45) = 12.45
	+14			Σ = 146.3
	1 1			

a. Find the class width.

1 ✓

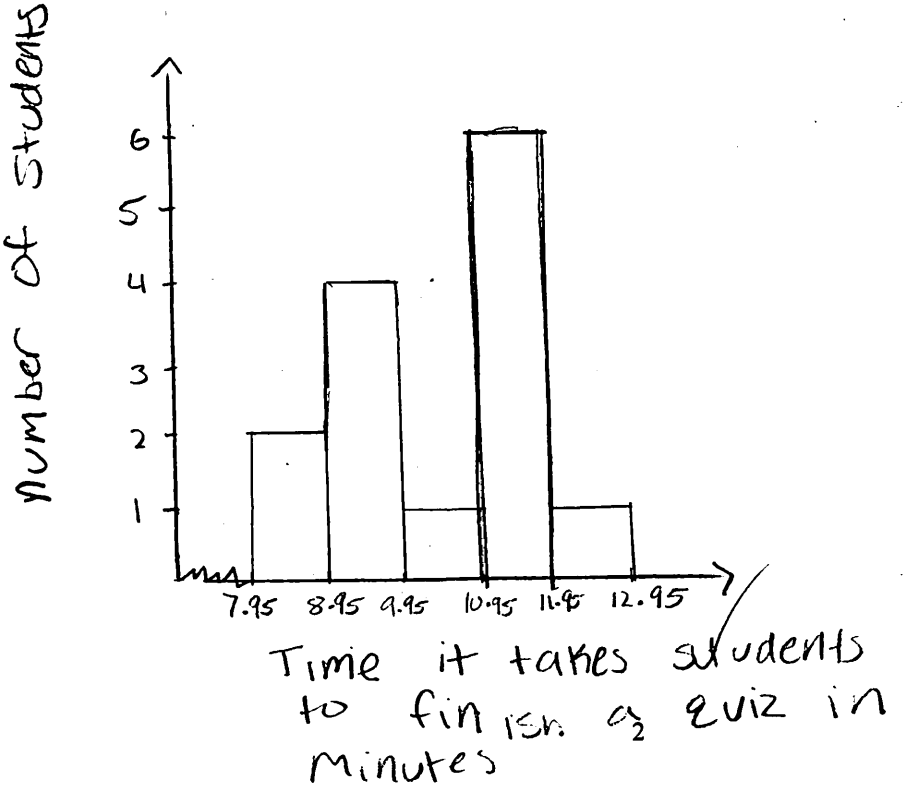
b. Find the class midpoints, extend a column to fill in those numbers.

c. Find the class boundaries, extend a column to fill in those numbers.

d. Find the mean of the frequency distribution.

$\frac{146.3}{14} = 10.45$ ✓

e. Construct a Histogram.



Solve the problem.

8) (4) Michael gets test grades of 60, 75, 82, and 86. He gets 95 on his reading log and a 81 on his final exam. Find the weighted mean if the tests each count for 15%, reading log counts for 10%, and the final exam counts for 30% of the final grade. Round to one decimal place.

w	f	wf
.15	60	9
.15	75	11.25
.15	82	12.3
.15	86	12.9
.10	95	9.5
.30	81	24.3
		79.25

$\frac{79.25}{1} = 79.25 \approx 79.3$

Use the given data to construct a frequency distribution.

9) (5) Given a data set. Construct a frequency distribution using 5 classes.

~~4.53~~ ~~3.83~~ ~~3.83~~ ~~4.23~~ ~~4.70~~ ~~1.83~~ ~~4.00~~ ~~2.00~~ ~~3.57~~ ~~4.25~~ ~~2.75~~ ~~4.47~~ ~~3.35~~
~~3.27~~ ~~4.30~~ ~~4.25~~ ~~4.05~~ ~~2.12~~ ~~4.63~~ ~~4.18~~ ~~4.05~~ ~~2.13~~ ~~4.60~~ ~~4.53~~ ~~3.70~~ ~~4.17~~
~~1.87~~ ~~4.68~~ ~~1.83~~ ~~4.10~~

Class	frequency
1.83 – 2.40	~~||||~~ | = 6
2.41 – 2.98	| = 1
2.99 – 3.56	|| = 2
3.57 – 4.14	~~||||~~ ||| = 8
4.15 – 4.72	~~||||||||~~ ||| = 13

$4.7 - 1.83 = 2.87$

$\frac{2.87}{5} = .574 \approx .58$

10) (4) **Write the symbol for each.**

a. Sample mean: $\bar{x}$

b. Population standard deviation: σ

c. Sample standard deviation: s

d. Populaiton mean: μ

Provide an appropriate response.

11) (4) A television station claims that the amount of advertising per hour of broadcast time has an average of 12 minutes and a standard deviation equal to 1.7 minutes. You watch the station for 1 hour, at a randomly selected time, and carefully observe that the amount of advertising time is equal to 19 minutes. Calculate the z-score for this amount of advertising time.

$\frac{19-12}{1.7} = \frac{7}{1.7} \approx 4.12$ ✓

(4) Provide an appropriate response.

12) Find the z-score for the value 84, when the mean is 74 and the standard deviation is 2.5. Is 84 a significantly high value?

$\frac{84-74}{2.5} = \frac{10}{2.5} = 4$ ✓

yes. 84 is a significantly high value because the z score is not ✓ between the values -2 and 2

13) (6) Currently, there are 4612 colleges in the U.S., and the number of full-time students is 13,203,477.

a. Are the number of full-time students at diffent colleges discrete or continuous?

discrete ✓

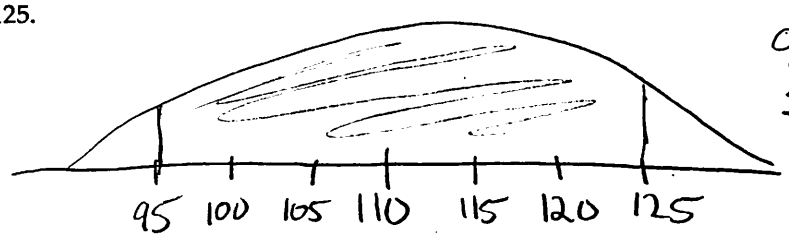
b. What is the level of measurement for the numbers of full-time students at colleges?

ratio ✓

c. What is wrong with surveying college students by mailing questionnaires to 10,000 of them who are randomly selected? It will not be accurate because only certain people might respond skewing the data.

Provide an appropriate response.

14) (4) The average score of local students on a college entrance exam is 110, with a standard deviation of 5. The distribution is roughly bell shaped. Use the Empirical Rule to find the percentage of local students with scores between 95 and 125.



99.7% students scored between 95 ✓ and 125

15) (4) The weights (in pounds) of seven dogs are listed below.

17 56 85 38 138 98, 85

Find the following:

a. Mean: ≈73.86

b. Median: 85

c. Standard Deviation: ≈40.379155

d. Variance: ≈1630.47616

(4) Provide an appropriate response.

16) Commuting times for employees of a local company have a mean of 63.6 minutes and a standard deviation of 2.5 minutes. What does Chebyshev's Theorem say about the percentage of employees with commuting times between 58.6 minutes and 68.6 minutes?

$\frac{58.6-63.6}{2.5} = -2$ $\qquad$ $\frac{68.6-63.6}{2.5} = 2$ $\qquad 1-\frac{1}{2^2} = \frac{4}{4}-\frac{1}{4} = \frac{3}{4}$

At least 75% of employees have commuting times between 58.6 and 68.6 minutes

17) (6) The preschool children at Elmwood Elementary School were asked to name their favorite color. The results are listed below.

purple	purple	green	red	blue
blue	blue	purple	blue	green
blue	green	red	red	red
green	blue	red	blue	yellow

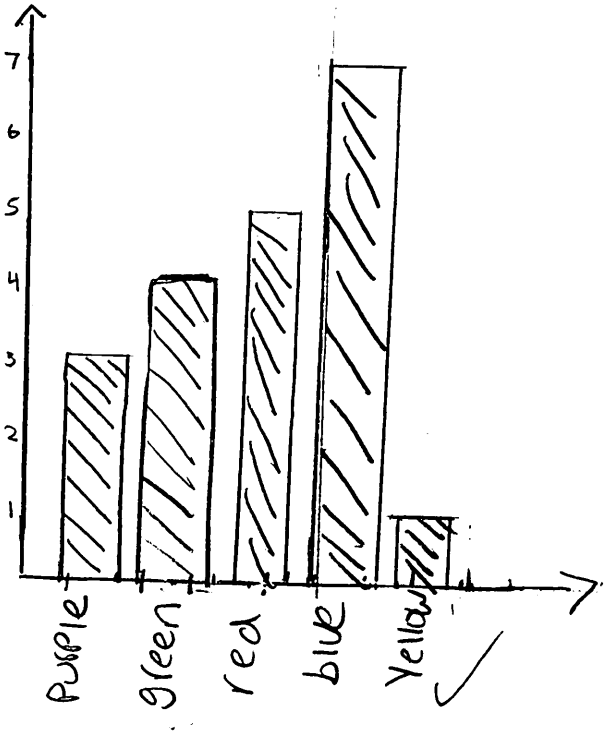
a. Construct a frequency distribution.

b. Construct a bar graph.

a)

Class	Frequency
purple	III = 3
green	IIII = 4
red	HH = 5
blue	HH II = 7
yellow	I = 1

b)



(3) Determine the original set of data.

18)

Stem	Leaves
7	5
8	3
9	0 2
10	6
11	6 7
12	6 9
13	6 7 9
14	2 3 8 9
15	8 9

Legend: 5|5 represents 55

75, 83, 90, 92, 106, 116, 117, 126, 129,
136, 137, 139, 142, 143, 148, 149, 158, 159

Find the indicated measure.

19) (15: 3,3, 3, 4, 2) The weights (in pounds) of 30 newborn babies are listed below.

5.0	5.7	5.8	5.9	6.1	6.1	6.4	6.4	6.5	6.6
6.7	6.7	6.7	6.9	7.0	7.0	7.0	7.1	7.2	7.2
7.4	7.5	7.7	7.7	7.8	8.0	8.1	8.1	8.9	10.7

a. Find P_{63}.

$\frac{63}{100} \cdot 30 = 18.9 \approx 19$

$P_{63} = 7.2$

b. Find the percentile for the value 7.4.

$\frac{21}{30} = .7 \times 100 = 70$

70%. $P_{70} = 7.4$

OR

$\frac{20}{30} \cdot 100$

$= 66.7$

≈ 67

$P_{67} = 7.4$

c. Find all quartiles (Q1, Q2, and Q3).

$Q1 = 6.4$ $Q3 = 7.7$

$Q2 = 7$

d. Find the mean, median, and mode.

Mean: ≈ 7.063 Median: 7 Mode: 6.7 and 7.0 Midrange: $7.85 = \frac{15.7}{2}$

e. Find the standard deviation and variance.

Standard deviation: 1.084207428 Variance: 1.175505747