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Math 150 Fall 2014 Test 4

The following formula might be useful:

$$\sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}} \text{ or } \sqrt{\frac{\sum(fx^2) - n\bar{x}^2}{n - 1}}$$

There are twenty-five questions total with point values given below. Where indicated, write your answer in the space provided. Good luck!

1. A Find the median of the following data: (3 points)

68, 64, 23, 68, 70, 72, 72, 68

(a) 68 (b) 70 (c) 69.5 (d) 49

2. C Find the range of the following data: (3 points)

30, 19, 125, 150, 430, 50, 225

(a) 125 (b) 19 (c) 411 (d) 50

3. D At one high school, students can run the 100-yard dash in an average of 15.2 seconds with a standard deviation of .9 seconds. The times are very closely approximated by a normal curve. Find the percent of times that are less than 15.2 seconds. (3 points)

(a) 68% (b) 16% (c) 34% (d) 50%

4. B Holiday bonuses for a group of employees were: \$525, \$368, \$472, \$493, and \$508. Find the standard deviation for these bonuses. (3 points)

(a) \$473.20 (b) \$61.96 (c) \$3838.70 (d) \$55.42

5. D Find the mode of the following data: (3 points)

60, 240, 270, 180, 240, 210, 240, 300, 330, 360, 240, 120

(a) 300 (b) 60 (c) 330 (d) 240

6. C Data for a particular population is normally distributed with a mean of 125 and a standard deviation of 8. What percent of the data value will lie between 109 and 141? (3 points)

(a) 50% (b) 68% (c) 95% (d) 99.7%

7. A Over a period of days, Fester jogged a total of 209 miles averaging 2.75 miles per day. How many days did Fester go jogging? (3 points)

(a) 76 (b) 575 (c) 10 (d) Cannot be determined

8. B The average size of the fish in a lake is 11.4 inches, with a standard deviation of 3.2 inches. Find the probability of catching a fish longer than 17 inches. (3 points)

- (a) 8% (b) 4% (c) 96% (d) 5%

9. C Find the mean of the following data: (3 points)

9.2, 10.4, 13.5, 8.7, 9.7

- (a) 51.5 (b) 12.88 (c) 10.3 (d) 7.18

10. D A company installs 5000 light bulbs, each with an average life of 500 hours, standard deviation of 100 hours, and distribution approximated by a normal curve. Find the approximate number of bulbs that can be expected to last between 290 hours and 500 hours. (3 points)

- (a) 2911 (b) 2913 (c) 2413 (d) 2410

11. B Find the mean for the frequency distribution (rounded to the nearest tenth).

Value	Frequency
16	1
17	4
23	5
31	5
36	2

(3 points)

- (a) 28.4 (b) 25.1 (c) 7.2 (d) 23.3

12. C Find the percent of the total area under the curve between $z = -2.36$ and $z = -0.14$. (3 points)

- (a) 43.9% (b) 43.1% (c) 43.5% (d) 43.4%

13. A The mean score on a set of 35 tests was 73.4. What is the sum of the test scores? (3 points)

- (a) 2569 (b) 35 (c) 2.1 (d) 73.4

14. D If the mode and the median of a data set are both less than 50, then the mean of the data set must be: (3 points)

- (a) Less than 50. (b) Equal to 50. (c) Greater than 50. (d) Cannot be determined.

15. D A particular data set has a range of 38. Which choice below is possible for the high and low data values? (3 points)

- (a) High = 28, Low = 10 (b) High = 92, Low = 54
(c) High = 38, Low = 0 (d) Both choices B and C are possibilities.

16. A A particular set of data has mean 96 and standard deviation 5. What is the z-score for a data value of 89? (3 points)

- (a) -1.40 (b) 1.40 (c) 0.14 (d) -0.14

17. B The mean for a class of 42 students on a particular test was 74%. Which statement below is the most accurate interpretation of this statistic? (3 points)

- (a) The standard deviation for this test was approximately 6%.
- (b) If all class test scores had been equal, they would all be 74%.
- (c) The most frequent score on this test was a 74%.
- (d) One-half of the class scored higher than a 74%.

18. A If the median of a data set occupies the 47th position, then n for the data set is: (3 points)

- (a) 93 (b) 24 (c) 94 (d) 47

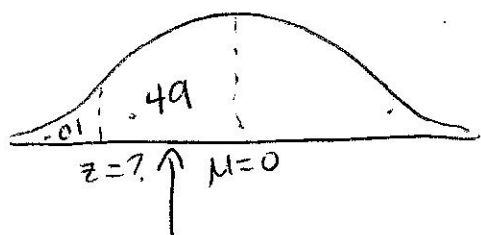
19. D The scores on a standardized test in a suburban high school have a mean of 80, with a standard deviation of 12. What is the probability that a student will have a score less than 60? (3 points)

- (a) .4525 (b) .5475 (c) .9525 (d) .0475

20. A The mean for a set of 6 data values is 57. Five of the data values are 36, 72, 54, 21, and 91. What is the sixth data value? (3 points)

- (a) 68 (b) 64 (c) 60 (d) Cannot be determined

21. (5 points) Find a z -score so that 1% of the total area is to the left of z .



$A = .49$ when $z = -2.33$

22. (15 points) The data below represents ages of drivers entering a fast-food restaurant:

26, 43, 17, 20, 25, 37, 54, 28, 20, 19

- (a) Construct a stem-and-leaf plot for this data.
- (b) Construct a frequency distribution for these numbers.
- (c) Construct a histogram for this data.

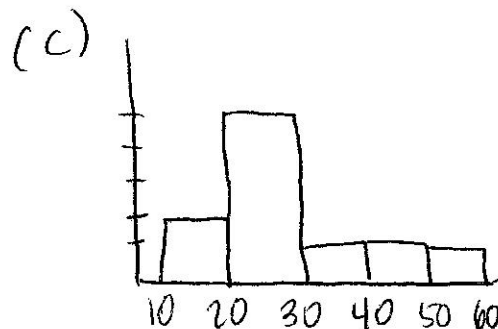
(a)

1	7	9
2	0	0 5 6 8
3	7	
4	3	
5	4	

(b)

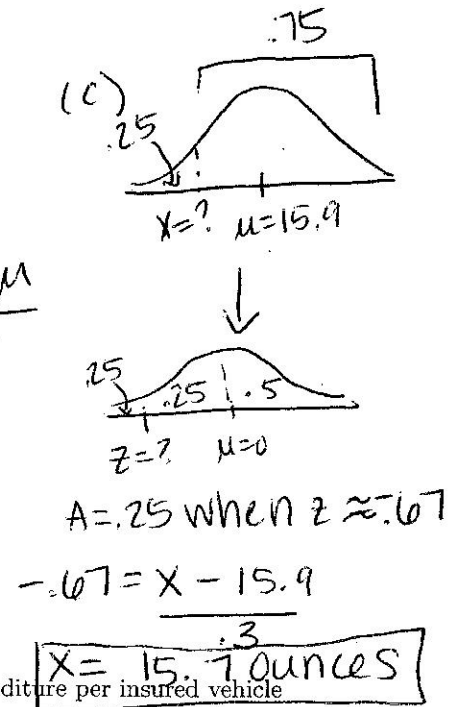
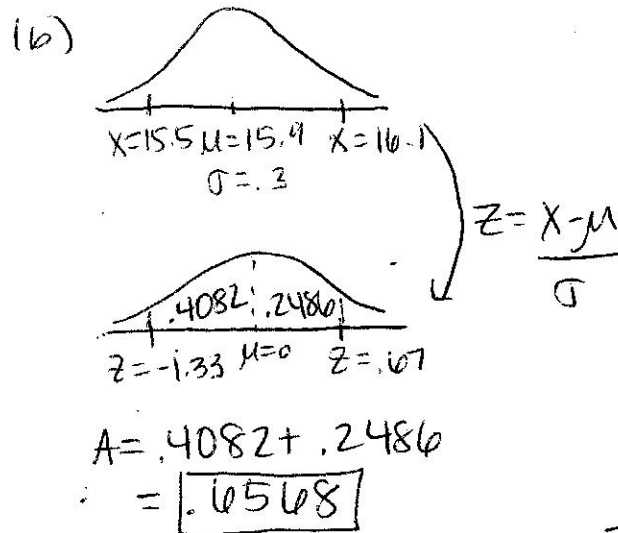
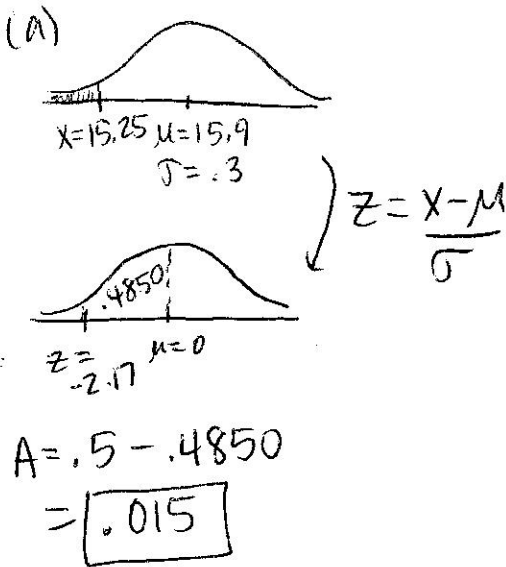
	f
10-19	2
20-29	5
30-39	1
40-49	1
50-59	1

3



23. (9 points) A sample of 200 bags of Pepperidge Farm pizza-flavored goldfish found the weights of the bags to be normally distributed with a mean of 15.9 ounces and a standard deviation of .3 ounces. Find the probability that a randomly selected bag of goldfish:

- (a) weighed less than 15.25 ounces.
- (b) weighed between 15.5 ounces and 16.1 ounces.
- (c) Find the weight that separated the lightest 25% from the heaviest 75%.



24. (6 points) The following stem-and-leaf plot gives the average insurance expenditure per insured vehicle (in tens of dollars) for the 50 states and the District of Columbia:

Stem	Leaves
5	5 5 6 8 9
6	0 1 2 3 4 5 5 6 7 7 8 8 9 9 9
7	0 2 3 4 4 5 5 8 9 9
8	2 4 4 4 4 5
9	2 3 4 6 8 9
10	2 5 6 7
11	1 2 8 8

Units: 11|8 = \$1180

- (a) What is the shape of the distribution? *right skewed*
- (b) How many states have an average expenditure of over \$1000? *8*
- (c) How many states have an average expenditure of \$840? *5*

25. (5 points) Anthony is a waiter at an Italian restaurant. He waited on 5 tables last night. The amounts he received as tips were \$15, \$8, \$12, \$13, and \$22. Calculate the standard deviation for his tips. Show all your calculations.

$$\bar{x} = \frac{15 + 8 + 12 + 13 + 22}{5} = 14$$

X	$X - \bar{X}$	$(X - \bar{X})^2$
15	1	1
8	-6	36
12	-2	4
13	-1	1
22	8	64

$$\text{Total} = 106$$

$$S = \sqrt{\frac{106}{4}} = \sqrt{26.5} = 5.15$$