

Your best 20 out of 21 will count 5 points each

In Problems 1 – 5 you are given the following data:

158, 191, 257, 135, 207, 158, 257, 261, 158, 184, 201, 187, 201, 201, 156, 226, 143

show your work to find

1. The mean
2. The median
3. The mode(s)
4. The range
5. The variance
6. Given the following chart below calculate the Mean of the data

x	20	50	80	100	140
f(x)	15	4	21	16	14

7. Give the 5% Trimmed mean for the following 20 values: (also state which two values are trimmed)

83 15 30 40 30 46 50 75 100 75  
80 30 47 60 51 82 81 65 127 73

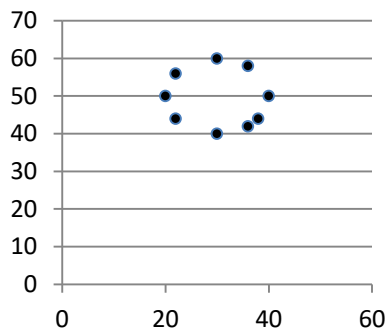
8. Give the coefficient of variation  $\frac{s}{\bar{x}} \times 100\%$  for the following data: 10, 20, 50, 30, 40

9. A manufacturer of automobile batteries claims that the average length of life for its grade A battery is 60 months. Suppose the standard deviation of the life length is known to be 10 months and the frequency distribution of the life length data is unknown. Use Chebyshev's Theorem to explain how to determine the approximate percentage of the manufacturer's grade A batteries that could be expected to last between 50 and 70 months, assuming the manufacture's claim to be true.

10. Given the five number summary 35, 50, 65, 115, 135 draw the corresponding Box and Whisker plot.

11. Given the scatter diagram below the sample correlation coefficient,  $r$ , is most likely

- a) Positive    b) Zero    c) Negative    (give brief explanation as to your choice)



12. Suppose a committee of three people is to be chosen from a group of seven people. How many different committees can be formed consisting of a president, VP, and treasurer?

13. What is the probability of drawing a red number from a standard deck of 52 cards?

14. What is the probability on a single roll of a die to get a number 3 or less?

15. Evaluate  ${}^9C_2$

**In Problems 16 - 19 Given a Normal Distribution find**

16.  $\Pr(0 < Z < 1.15)$

17.  $\Pr(Z < 1.43)$

18.  $\Pr(-1.22 < Z < 2.17)$

19.  $\Pr(-1.50 < Z < 0)$

**Suppose scores on a M114 test are normally distributed with mean 70 and standard deviation 10.**

20. Find the probability that a student scores between 55 and 75 on the test.

21. Find the probability that a student scores less than 84 on the test.

## MATH114 COLLEGE MATH & STATISTICS Test 4 Formula sheet

if  $n$  is odd the median is the  $(n + 1) / 2$  ranked data point

if  $n$  is even the median is the average of the  $n / 2$  and  $(n/2) + 1$  ranked data points

$${}^n P_r = \frac{n!}{(n-r)!} \quad \bar{x} = \frac{\sum fx_i}{n} \quad s^2 = \frac{\sum (x - \bar{x})^2}{n-1}$$

$${}^n C_r = \frac{n!}{r!(n-r)!} \quad \bar{x} = \frac{\sum x}{n} \quad z = \frac{x - \mu}{\sigma}$$

$$\text{C.V.} = \frac{s}{\bar{x}} \times 100\%$$

To compute a 5% trimmed mean

- 1) Order the data from smallest to largest.
- 2) Delete the bottom 5% of the data and the top 5% of the data. (If the calculation of 5% does not produce a whole number, round to the nearest integer.)
- 3) Compute the mean of the remaining 90% of the data

**Chebyshev's Theorem:** For any set of data (either population or sample) and for any constant  $k$  greater than one, the proportion of the data that must lie within  $k$  standard deviations on either side of the mean is at least

$$1 - \frac{1}{k^2}$$

**Box-and-Whisker Plot**

1. Draw a vertical scale to include the lowest and highest data values.
2. To the right of the scale, draw a box from  $Q_1$  to  $Q_3$ .
3. Include a solid line through the box at the median level.
4. Draw vertical lines, called *whiskers*, from  $Q_1$  to the lowest value and from  $Q_3$  to the highest value.