Test 1 SHORT ANSWER QUESTIONS

1. What is the population?
2. What is a sample?
3. List three problems with using the number 868/1523 (obtained from a Gallup poll) for the probability that all adults bought a lottery ticket last year. \_\_\_\_\_ & it could be a bad sample & people could lie or forget.
4. List three problems with using the number 868/1523 (obtained from a Gallup poll) for the probability that all adults bought a lottery ticket last year. \_\_\_\_\_ & it is only a sample & people could lie or forget.
5. List three problems with using the number 868/1523 (obtained from a Gallup poll) for the probability that all adults bought a lottery ticket last year. \_\_\_\_\_ & it is only a sample & it could be a bad sample
6. If the sample size in the Gallup poll went from 1523 to 6523 will the percentage that said they bought a lottery ticket most likely go up, most likely go down, or can you not tell?
7. If you take two samples of the same size from the same population will the percentage that bought a lottery ticket be the same?
8. Which is likely to be closer? The percentages in two samples of size 5 from the same population, or the percentages in two samples of size 500 from the same population?
9. In a discrete probability model all the probabilities of all the outcomes add up to what number?
10. In a continuous probability model what adds up to 1?
11. Three ways of determining probability are \_\_\_\_\_\_\_\_, theory, and guess.
12. Three ways of determining probability are \_\_\_\_\_\_\_\_, experiment, and guess.
13. Three ways of determining probability are \_\_\_\_\_\_\_\_, theory, and experiment.
14. If someone gives you a coin, can you find exactly the probability it will land heads?
15. Suppose I give you a bent coin, how can you estimate the probability it will land heads?
16. Chance behavior has what property in the short run?
17. Chance behavior has what property in the long run?
18. When observing, do people tend to see the long run?
19. When observing, do people tend to give equal importance to all outcomes?
20. When observing, which outcomes do people tend to give more importance to?
21. Suppose airline A has three times as many flights out of a city than airline B which will have a higher percent of delayed flights? Most likely A, most likely B or you have no idea.
22. What is the notation for the population mean?
23. The variance and standard deviation measure what?
24. The mean measures what?
25. What is the notation for population variance?
26. What is the notation for population standard deviation?
27. What is the area under the *z* curve?
28. What is the mean of the *z* curve?
29. What is the standard deviation of the *z* curve?
30. What is the formula for the *z* curve?
31. Describe how far a standard deviation is on the *z* curve.
32. On the *z* curve how much of the data is within 1 standard deviation of the mean?
33. On the *z* curve how much of the data is within 2 standard deviations of the mean?
34. On the *z* curve how much of the data is within 3 standard deviations of the mean?
35. For any probability distribution how much of the data is within 1 standard deviation of the mean?
36. For any probability distribution how much of the data is within 2 standard deviations of the mean?
37. For any probability distribution how much of the data is within 3 standard deviations of the mean?
38. What is a parameter?
39. What is a statistic?
40. Most often what is calculated, a parameter or a statistic?
41. What is the notation for the sample mean?
42. What is the notation for the sample standard deviation?
43. What is the notation for the sample variance?
44. If the sample is random, what is the best guess for ?
45. If the sample is random, what is the best guess for ?
46. The Law of Large Numbers says that for what kind of samples  is more likely to be closer to ?
47. If you flip a fair coin and record the percentage of heads, you will get close to 50% by luck and \_\_\_\_\_\_\_\_\_\_.
48. If you flip a fair coin and record the percentage of heads, you will get close to 50% by \_\_\_\_\_ and having a large sample size.
49. If you flip a fair coin 10 times and get close to 50% it will be mostly due to what?
50. If you flip a fair coin 1000 times and get close to 50% it will be mostly due to what?
51. If you were to get all samples of the same size from a population with mean , the mean of all these sample means would be what?
52. If you were to get all samples with replacement of size *n* from a population with standard deviation , the standard deviation of all these sample means would be what?
53. For large samples is there much difference between sampling with and without replacement.
54. If the original data is normal, what about the shape of all sample means from samples of the same size?
55. If the original data is not normal, what happens to the shape of all sample means from samples of size *n* as *n* goes up?
56. What is the name of the theorem that says as the sample size goes up that the sample means become closer to normal?
57. Consider data sets A:{25,26,26,25,24} and B:{15,25,38,22,40}. If you know one set of data is 5 individuals and the other is 5 averages, which is more likely to be the 5 averages? \_\_\_\_\_.
58. Consider data sets A:{25,26,26,25,24} and B:{15,25,38,22,40}. If you know one set of data is 5 individuals and the other is 5 averages, A is more likely to be the 5 averages? This is because the \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ of averages is smaller.
59. Consider data sets A:{25,26,26,25,24} and B:{15,25,38,22,40}. If you know one set of data is 5 individuals and the other is 5 averages, A is more likely to be the 5 averages? This is because the standard deviation of averages is \_\_\_\_\_\_\_\_\_.
60. Explain why it makes sense that averages tend to have a smaller standard deviation than individuals?
61. , , and *s* are all standard deviations. Match them with A) standard deviation of a sample, B) standard deviation of the population C) standard deviation of all sample means.
62. Which two of the three should be close? , , and *s*
63.  and *s* should be close and should be what compared to them?
64. What does the *z* score tell us in terms of standard deviation?
65. Is it human nature to tend to pay more attention to anecdotes or all the data?
66. Which is more important to pay attention to, anecdotes or all the data?
67. Give an example of how data beat anecdotes.
68. What is a lurking variable?
69. Give an example of lurking variable.
70. Why does the following graph make it look like drivers under 25 are the worst? 
71. Two problems with the graph are the y-axis does not start at 0 and \_\_\_\_\_\_\_\_\_\_\_\_. 
72. Two problems with the graph are we don’t how the data were obtained and \_\_\_\_\_\_\_. 
73. Why do we do statistical graphs?
74. Let’s compare percent of children abused in Idaho and Virginia. In Idaho its 22.6% and in Virginia its only 5.9%. Does this mean it is safer for children in Virginia? Explain.
75. How is it that in 1998 North Dakota that was 45th in spending per pupil has a much higher SAT average (by almost 200 points) than New Jersey that was 2nd in spending per pupil?
76. Suppose in a big city it is found that in all fatal car accidents 25% were under the influence of alcohol and 75% were not. It seems that it is better to be drunk, explain why it is not the case.
77. Are statistical conclusions about populations based on samples ever 100% sure?
78. A good graph will show that many people most likely in Florida voted for whom by mistake in 2000?
79. In a CI as the confidence level goes up, what happens to the margin of error?
80. In a CI as the sample size goes up, what happens to the margin of error?
81. In a CI if the standard deviation gets higher, what happens to the margin of error?
82. All things being equal, do we prefer the margin of error to be big or small?
83. If and the  and the data is normal, what will be the mean of sample means of size 16?
84. If and the  and the data is normal, what will be the standard deviation of sample means of size 16?
85. If and the  and the data is normal, what will be the shape of sample means of size 16?
86. Is the *z* distribution symmetric?
87. Is the mean sensitive to outliers?
88. Is the standard deviation sensitive to outliers?
89. Is the median sensitive to outliers?
90. Are the quartiles sensitive to outliers?
91. Suppose you have data only summarized in different numerical ranges. How can you estimate the mean and standard deviation?