

TMATYC
STATISTICS TEST
 Spring 2003

1. A researcher tested for toxin levels in water samples and found a mean of 98 and a standard deviation of 13. If toxin levels are normally distributed, then 95% of the samples have levels between

A. 59 and 137 B. 72.5 and 123.5 C. 76.6 and 119.4 D. 81.3 and 114.7

2. What is the arithmetic mean of the numbers represented by the stem-and-leaf displayed at the right?

10	0
11	1
12	3
13	4
14	2

A. 122 B. 123 C. 124 D. 126

3. What is the expected value of the probability distribution given at right?

x	P(x)
0	0.0
10	0.1
20	0.2
30	0.3
40	0.4

A. 25 B. 26 C. 30 D. 31

4. A homeowner bought 3 used smoke detectors at a garage sale. If he estimates each has a 90% probability of working, what should his estimate be of the probability that at least one will detect a fire?

A. 90.9% B. 91% C. 99% D. 99.9%

5. A manufacturing firm knows that 3% of the products they produce are defective. They accidentally shipped a batch of 30 that had not been tested. If the receiving company randomly selects 5 of the 30 to be tested, what is the probability none are defective?

A. .833 B. .838 C. .847 D. .859

6. There are 185 statistics students in a Midwestern college, and their mean age is 26.3 with a standard deviation of 8.0. If each student is required to find the ages of a sample of 16 students, what is the standard deviation of the sampling distribution of the sample means?

A. 1.86 B. 1.92 C. 2.83 D. 4

7. Approximately 40% of the population has type A blood. If 100 samples are selected at random what is the probability (to the nearest percent) that exactly 40 are type A?

- A. 8% B. 16% C. 20 % D. 40%

8. If the weatherman states that there is a 40% probability of rain Friday, 40% on Saturday, and also 40% on Sunday, what is the probability of no rain during the three days?

- A. 6.4% B. 9.6% C. 21.6% D. 40%

9. The frequency distribution at right represents the distribution of grades on a certain statistics test. What is the mean grade?

- A. 68.3 B. 74.5 C. 77.6 D. 78.1

Grade	Frequency
50-59	2
60-69	3
70-79	6
80-89	7
90-99	4

10. The mean and standard deviation of two tests are listed to the right. If the grades on each are normally distributed, what score on the first test is relatively equivalent to 950 on the second?

	Mean	Standard Deviation
Test 1	21.3	5.2
Test 2	830	124

- A. 24.1 B. 25.1 C. 25.7 D. 26.3

11. Ages of students and their grades on a test are represented below. The Pearson product moment correlation coefficient is -0.975 . If the outlier is removed, what is the new correlation coefficient?

X_i	18	19	22	47	19	23	21	20
Y_i	78	82	83	41	81	79	79	80

- A. 0.125 B. 0.133 C. 0.228 D. 0.247

12. From a sample of 100 scores, the confidence interval for the mean calculated at 95% confidence is 19.02 to 20.98. What is the product of the sample mean and standard deviation?

- A. 80 B. 100 C. 110 D. 120

13. In a hypothesis test, the null hypothesis is $H_0: \mu \leq 19$ and the test statistic is $z = 1.5$; what is the p-value?

- A. 0.0334 B. 0.0501 C. 0.0668 D. 0.1002

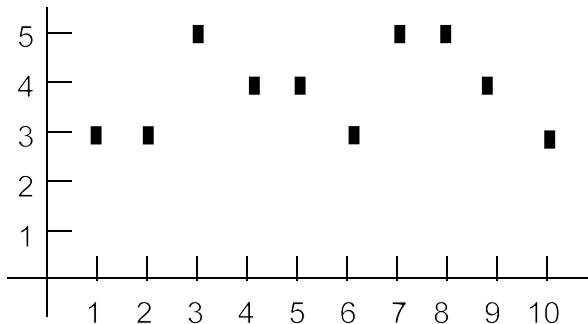
14. A stats student (with too much time on his hands) wondered what proportion of students carry their book bags on their right shoulder. He could not find the answer on the internet so he decided to do the research himself. After observing 752 randomly selected students he concluded that his sample proportion was within three percentage points of the population proportion. What level of confidence did he use for his study?

- A. 80% B. 90% C. 95% D. 98%

15. A study of the amounts of time college freshmen study each week found the distribution to be approximately normal with a mean of 7.06 hours and a standard deviation of 5.32 hours. If 55 freshmen are randomly selected, find the probability (correct to 2 decimal places) that their mean weekly study time exceeds 7.00 hours.

- A. 0.48 B. 0.50 C. 0.53 D. 0.57

16. The scatter diagram below represents the comparison of the first ten counting numbers and the number of letters in the spelling of the word, e.g. eight = (8, 5). The slope of the regression equation (using least squares) is approximately 0.0545. According to the regression equation, how many letters should be in the word "5" (rounded to 1 decimal place)?



- A. 3.9 B. 4.0 C. 4.5 D. 4.8

17. Data from two independent random samples taken from two populations are listed to the right. The lower limit of the 95% confidence interval for the difference between the two population means is 2.86. What is the upper limit?

Sample 1	Sample 2
$n_1 = 65$	$n_2 = 58$
$\bar{x}_1 = 36.5$	$\bar{x}_2 = 32.6$
$s_1 = 3.5$	$s_2 = 2.3$

- A. 4.01 B. 4.29 C. 4.64 D. 4.94

18. What is the interquartile range of this set of numbers? {9, 8, 9, 11, 15, 14, 8, 11, 12, 12}

- A. 1.5 B. 2 C. 2.5 D. 3

19. A sample of 10 numbers has a standard deviation of 8.756. If those same numbers were a population, what would the population standard deviation be?
- A. 7.880 B. 8.307 C. 8.700 D. 9.230
20. Bottles of soft drink labeled 100 mL are assumed to contain that much or more. A researcher sampled 25 bottles and found the mean volume to be 99.6 mL with a standard deviation of 1.2 mL. He wishes to test the null hypothesis at 95% confidence. If he assumes the distribution is normal, what would his critical value be?
- A. -2.064 B. -1.711 C. -1.667 D. -1.645
21. A troubled stats student decided there was only a 30% probability that he was going to pass the class but that there was a 60% chance that he was going to get a date with the girl sitting beside him. He decided the probability of both occurring was too depressing to consider so he decided to calculate the probability of either one or the other occurring. Can you help him out? What is the probability of either passing or getting the date?
- A. 18% B. 45% C. 72% D. 82%
22. What is the sample variance of this set of numbers? {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
- A. 1.7 B. 5.7 C. 7.7 D. 9.2
23. If three ordinary dice are rolled, what is the probability of the sum of all three being greater than 4?
- A. 0.944 B. 0.964 C. 0.972 D. 0.981
24. Scores from a certain standardized test are normally distributed with a mean of 800 and a standard deviation of 55. What is the average of the scores that are at the 60th and 75th percentile?
- A. 825.5 B. 837.5 C. 856 D. 940
25. The International Olympics Committee only allows six athletes from each country to enter the pogo-stick jumping contest. If there are 40 American athletes going to the pogo-stick jumping trials and 6 are from Tennessee, assuming equal selection what is the probability all will be Tennesseans?
- A. 1/240 B. 6/240 C. 1/3,838,380 D. 1/2,763,633,600

1	B
2	A
3	C
4	D
5	D
6	B
7	A
8	C
9	D
10	D
11	A
12	B
13	C
14	B
15	C
16	A
17	D
18	D
19	B
20	B
21	C
22	D
23	D
24	A
25	C