

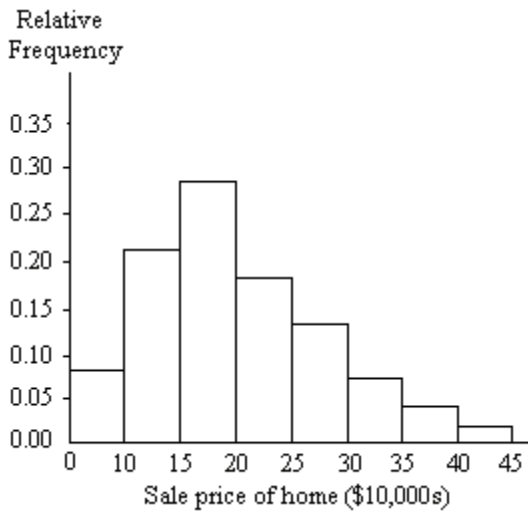
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) At one college, GPAs are normally distributed with a mean of 2.8 and a standard deviation of 0.5. Find the third quartile, Q_3 .
A) 3.135 B) 3.05 C) 2.465 D) 3.175

- 2) The value obtained for the test statistic, z , in a one-mean z -test is $z=1.31$. The test is a two tailed test. Determine the P-value.
A) 0.9049 B) 0.8098 C) 0.1902 D) 0.0951

- 3) The regression equation relating dexterity scores (x) and productivity scores (y) for ten randomly selected employees of a company is $\hat{y} = 5.50 + 1.91x$. Predict the productivity score for an employee whose dexterity score is 24.
A) 133.9 B) 51.3 C) 58.2 D) 56.3

- 4) A relative frequency histogram for the sale prices of homes sold in one city during 2006 is shown below.



State whether the distribution is (roughly) symmetric, right skewed, or left skewed.

- A) Right skewed B) Symmetric C) Left skewed

5) The age distribution of students at a community college is given below.

Age (years)	Number of students (f)
Under 21	2104
21-25	2194
26-30	1158
31-35	865
Over 35	228

A student from the community college is selected at random. The event A is defined as follows.

A = event the student is under 31

Determine the number of outcomes that comprise the event (not A).

- A) 228 B) 5456 C) 1093 D) 865

6) The volumes of soda in quart soda bottles are normally distributed with a mean of 32.3 oz and a standard deviation of 1.2 oz. What is the probability that the volume of soda in a randomly selected bottle will be less than 32 oz?

- A) 0.3821 B) 0.5987 C) 0.4013 D) 0.0987

7) In the past, the mean running time for a certain type of flashlight battery has been 9.0 hours. The manufacturer has introduced a change in the production method and wants to perform a hypothesis test to determine whether the mean running time has changed as a result. Determine the null and alternate hypotheses.

- A) $H_0 : \mu = 9.0$ hours B) $H_0 : \mu \geq 9.0$ hours C) $H_0 : \mu \neq 9.0$ hours D) $H_0 : \mu = 9.0$ hours
 $H_a : \mu > 9.0$ hours $H_a : \mu = 9.0$ hours $H_a : \mu = 9.0$ hours $H_a : \mu \neq 9.0$ hours

8) The amount of money, in dollars, that an employee of a bank spent on lunch on six randomly selected days yielded the following data set:

8, 13, 14, 12, 6, 16

Compute $(\sum x_i)^2$ and $\sum x_i^2$. Explain the difference between the two quantities.

- A) 69 and 4761 ; $(\sum x_i)^2$ is the sum of the squares of the data, whereas $\sum x_i^2$ represents the square of the sum of the data.
 B) 865 and 4761 ; $(\sum x_i)^2$ is the sum of the squares of the data, whereas $\sum x_i^2$ represents the square of the sum of the data.
 C) 4761 and 865 ; $(\sum x_i)^2$ is the square of the sum of the data, whereas $\sum x_i^2$ represents the sum of the squares of the data.
 D) 4624 and 69 ; $(\sum x_i)^2$ is the square of the sum of the data, whereas $\sum x_i^2$ represents the sum of the squares of the data.

9) Which of the following statements concerning areas under the standard normal curve is/are true?

- a. If a z-score is negative, the area to its right is greater than 0.5
 b. If the area to the right of a z-score is less than 0.5, the z-score is negative.
 c. If a z-score is positive, the area to its left is less than 0.5

- A) a, b B) b, c C) a, c D) a

- 10) A researcher wants to use a paired sample to determine whether the mean number of hours spent exercising per week for married men differs from the mean number of hours spent exercising per week for married women. Identify the paired-difference variable for the proposed hypothesis test.
- A) Difference between hours of weekly exercise of a randomly selected married man and hours of weekly exercise of a randomly selected married woman
 - B) Difference between hours of weekly exercise for a married man and hours of weekly exercise before he was married
 - C) Difference between hours of weekly exercise for a married man and hours of weekly exercise of his wife
 - D) Difference between mean hours of weekly exercise of married men and mean hours of weekly exercise of married women
- 11) Christine is currently taking college astronomy. The instructor often gives quizzes. On the past seven quizzes, Christine got the following scores.

42 11 36 29 14 50 64

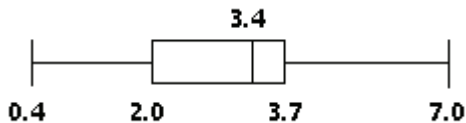
Find the sample standard deviation.

- A) 36
- B) 17.6
- C) 19
- D) 8645.1

- 12) The normal monthly precipitation (in inches) for August is listed for 20 different U.S. cities. Construct a boxplot for the data.

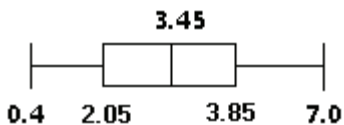
0.4 1.0 1.5 1.6 2.0
 2.2 2.4 2.7 3.4 3.4
 3.5 3.6 3.6 3.7 3.7
 3.9 4.1 4.2 4.2 7.0

A)



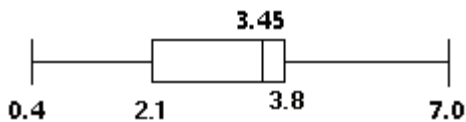
The data is highly left-skewed.

B)



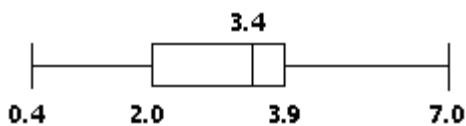
The data is symmetrical. It is a uniform distribution.

C)



The data is slightly left-skewed.

D)



The data is slightly left-skewed.

13) In one city, 47.3% of adults are female, 10.7% of adults are left-handed, and 4.7% are left-handed females. For an adult selected at random from the city, let

F = event the person is female

L = event the person is left-handed.

Find $P(F \text{ or } L)$. Round approximations to three decimal places.

- A) 0.580 B) 0.687 C) 0.533 D) 0.485

14) A health insurer has determined that the "reasonable and customary" fee for a certain medical procedure is \$1200. They suspect that the average fee charged by one particular clinic for this procedure is higher than \$1200. The insurer wants to perform a hypothesis test to determine whether their suspicion is correct. The hypotheses are:

$$H_0 : \mu = \$1200$$

$$H_a : \mu > \$1200$$

where μ is the mean amount charged by the clinic for this procedure.

Suppose that the results of the sampling lead to rejection of the null hypothesis. Classify that conclusion as a Type I error, a Type II error, or a correct decision, if in fact the average fee charged by the clinic is \$1200 .

- A) Correct decision B) Type II error C) Type I error

15) A pollster wishes to estimate the proportion of U.S. voters that oppose capital punishment. Obtain a sample size that will ensure a margin of error of at most 0.02 for a 92% confidence interval.

- A) 1914 B) 1915 C) 39 D) 7657

16) Of 270 employees selected randomly from one company, 15.56% of them commute by carpooling. Construct a 90% confidence interval for the percentage of all employees of the company who carpool.

- A) 10.4% to 20.7% B) 11.2% to 19.9% C) 9.86% to 21.2% D) 11.9% to 19.2%

17) In a clinical trial, 780 participants suffering from high blood pressure were randomly assigned to one of three groups. Over a one-month period, the first group received a low dosage of an experimental drug, the second group received a high dosage of the drug, and the third group received a placebo. The diastolic blood pressure of each participant was measured at the beginning and at the end of the period and the change in blood pressure was recorded. Identify the experimental units.

- A) The diastolic blood pressures of the participants
B) The treatment (i.e., placebo, low dosage of drug, or high dosage of drug)
C) The three different groups
D) The participants in the experiment

18) Let x represent the number that shows up when a balanced die is rolled. Then x is a random variable with a mean of 3.5 and a standard deviation of 1.71. Let \bar{x} denote the mean of the numbers obtained when the die is rolled 36 times. Determine the sampling distribution of \bar{x} .

- A) Approximately normal, mean = 3.5, standard deviation = 1.71
B) Normal, mean = 3.5, standard deviation = 0.05
C) Normal, mean = 3.5, standard deviation = 0.29
D) Approximately normal, mean = 3.5, standard deviation = 0.29

19) The salaries of ten randomly selected mathematicians are shown below. Find the sample median salary.

\$114,000 \$110,000 \$197,000 \$202,000 \$227,000
 \$100,000 \$114,000 \$827,000 \$216,000 \$165,000

- A) \$197,000 B) \$252,000 C) \$227,000 D) \$181,000

20) Determine the percentage of variation in the observed values of the response variable that is explained by a simple linear regression with x.

x	44.9	13.2	13.6	28.6	15.5
y	3	6	4	8	10

- A) 17.6% B) 42.9% C) 37.3% D) 41.9%

21) A researcher for a car insurance company wishes to estimate the mean annual premium that men aged 20–24 pay for their car insurance. A random sample of 16 men aged between 20 and 24 yields the following annual premiums, in dollars.

812 913 908 901
 601 926 742 591
 905 420 580 725
 856 610 720 985

Use the data to obtain a point estimate of the mean annual premium for all men aged between 20 and 24. Round your answer to the nearest dollar.

- A) \$762 B) \$744 C) \$739 D) \$753

22) A company manufactures calculators in batches of 64 and there is a 4% rate of defects. Find the probability of getting exactly 3 defects in a batch.

- A) 0.22105 B) 2.88 C) 3453.87152 D) 2.6665

23) The following table is obtained from a random sample of 30 absences.

Day	Mon	Tue	Wed	Thur	Fri
Number Absent	9	1	7	6	7

You wish to test the claim that the absences occur on the five days with equal frequency. What is the value of the χ^2 test statistic?

- A) $\chi^2 = 6$ B) $\chi^2 = 3.6$ C) $\chi^2 = 9$ D) $\chi^2 = 4.5$

24) On a multiple choice test with 6 questions, each question has four possible answers, one of which is correct. For students who guess at all answers, find the mean for the random variable X, the number of correct answers.

- A) 1.5 B) 2 C) 3 D) 4.5

25) The table reports the distribution of pocket money, in bills, of the 6 students in a statistics seminar.

Student	Hannah	Ming	Keshaun	Tameeka	Jose	Vaishali
Amount, in dollars	2	4	4	5	5	7

For a random sample of size two, find the probability, expressed as a percent rounded to the nearest tenth, that the sample mean will be within \$1 of the population mean.

A) 80.0%

B) 78.6%

C) 73.3%

D) 66.7%

Answer Key

Testname: MUALPHATHETA_STATS_2012

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