

Name _____

MATH 2342-003 FINAL**MULTIPLE CHOICE.** Choose the one alternative that best completes the statement or answers the question.**Determine which of the four levels of measurement (nominal, ordinal, interval, ratio) is most appropriate.**

1) The subjects in which college students major.

- A) Interval B) Nominal C) Ordinal D) Ratio

Determine whether the given value is a statistic or a parameter.

2) A sample of 120 employees of a company is selected, and the average age is found to be 37 years.

- A) Statistic B) Parameter

Find the original data from the stem-and-leaf plot.

3)

Stem	Leaves
40	1 7 8
41	1 4 8
42	1 8

- A) 41, 47, 48, 42, 45, 49, 43, 50 B) 40178, 41148, 4218
 C) 401, 407, 408, 411, 414, 418, 421, 428 D) 401, 407, 418, 411, 414, 418, 421, 438

Solve the problem.

4) The heights in feet of people who work in an office are as follows. Use the range rule of thumb to find the standard deviation. Round results to the nearest tenth.

6.1 5.5 5.6 5.4 5.7 5.8 5.6 6.2 5.7 5.8

- A) 0.1 B) 0.2 C) 1.2 D) 0.5

Find the median for the given sample data.

5) The salaries of ten randomly selected doctors are shown below.

\$148,000 \$116,000 \$169,000 \$207,000 \$244,000

\$142,000 \$113,000 \$817,000 \$219,000 \$193,000

Find the median salary.

- A) \$237,000 B) \$263,000 C) \$181,000 D) \$169,000

Find the indicated probability.

6) The table below describes the smoking habits of a group of asthma sufferers.

	Nonsmoker	Occasional smoker	Regular smoker	Heavy smoker	Total
Men	344	40	85	39	508
Women	370	31	88	48	537
Total	714	71	173	87	1045

If one of the 1045 people is randomly selected, find the probability that the person is a man or a heavy smoker.

- A) 0.495 B) 0.532 C) 0.569 D) 0.448

7) Find the probability of correctly answering the first 3 questions on a multiple choice test if random guesses are made and each question has 6 possible answers.

- A) $\frac{1}{729}$ B) $\frac{1}{2}$ C) $\frac{1}{216}$ D) 2

Solve the problem.

8) There are 10 members on a board of directors. If they must form a subcommittee of 3 members, how many different subcommittees are possible?

- A) 720 B) 120 C) 6 D) 1000

Determine whether the given procedure results in a binomial distribution. If not, state the reason why.

9) Rolling a single "loaded" die 19 times, keeping track of the numbers that are rolled.

- A) Not binomial: there are too many trials.
B) Procedure results in a binomial distribution.
C) Not binomial: the trials are not independent.
D) Not binomial: there are more than two outcomes for each trial.

Find the indicated probability.

10) Find the probability of at least 2 girls in 5 births. Assume that male and female births are equally likely and that the births are independent events.

- A) 0.813 B) 0.500 C) 0.313 D) 0.188

If Z is a standard normal variable, find the probability.

11) The probability that Z lies between -2.41 and 0

- A) 0.4610 B) 0.4920 C) 0.0948 D) 0.5080

Find the indicated probability.

12) The diameters of pencils produced by a certain machine are normally distributed with a mean of 0.30 inches and a standard deviation of 0.01 inches. What is the probability that the diameter of a randomly selected pencil will be less than 0.285 inches?

- A) 0.4332 B) 0.0668 C) 0.0596 D) 0.9332

Solve the problem.

13) Suppose that replacement times for washing machines are normally distributed with a mean of 10.7 years and a standard deviation of 1.9 years. Find the replacement time that separates the top 18% from the bottom 82%.

- A) 12.4 years B) 11.0 years C) 9.0 years D) 11.7 years

14) Find the critical value $t_{\alpha/2}$ that corresponds to a confidence level of 95% and a sample size of 23.

- A) 2.074 B) 2.069 C) 1.717 D) 1.714

Given the sample statistics, determine if you should use the t distribution, normal distribution, or neither to construct a confidence interval for an estimate of μ .

15) From a sample of 19 observations, $\bar{x} = 154$, $\sigma = 38$. The data have a bell-shaped distribution.

- A) Normal distribution B) Neither C) t distribution

Solve the problem.

16) Find the critical value χ^2_R corresponding to a sample size of 6 and a confidence level of 95 percent.

A) 12.832

B) 11.07

C) 0.831

D) 1.145

Identify the null hypothesis H_0 and the alternative hypothesis H_1 . Use μ for a claim about a mean, p for a claim about a proportion, and σ for a claim about variation.

17) Carter Motor Company claims that its new sedan, the Libra, will average better than 21 miles per gallon in the city. Use μ , the true average mileage of the Libra.

A) $H_0: \mu > 21$

B) $H_0: \mu < 21$

C) $H_0: \mu \geq 21$

D) $H_0: \mu \leq 21$

$H_1: \mu \leq 21$

$H_1: \mu \geq 21$

$H_1: \mu < 21$

$H_1: \mu > 21$

Compute the value of an appropriate test statistic for the given hypothesis test.

18) You wish to test the claim that $\mu < 3.35$ at the $\alpha = 0.02$ significance level. In a sample of $n = 25$, the sample mean is 3.25 and the standard deviation is 0.87. Compute the value of the appropriate test statistic.

A) $t = -0.11$

B) $t = -0.57$

C) $t = 0.57$

D) $t = -2.87$

Compute the value of an appropriate test statistic for the given hypothesis test and sample data. Assume that the population is normally distributed and that the sample has been randomly selected.

19) A city official is investigating the efficiency of the local bus service. She claims that the standard deviation of the waiting times for bus number 5 is greater than 7.8 minutes. She took bus number 5 on 25 different occasions and the waiting times had a standard deviation of 12.4 minutes. In a hypothesis test of the city official's claim, what is the value of the appropriate test statistic?

A) $\chi^2 = 1579.553$

B) $\chi^2 = 60.655$

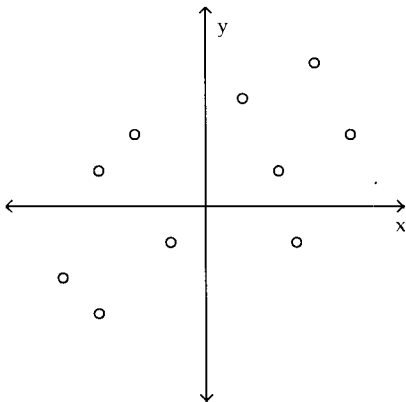
C) $\chi^2 = 9.496$

D) $\chi^2 = 38.154$

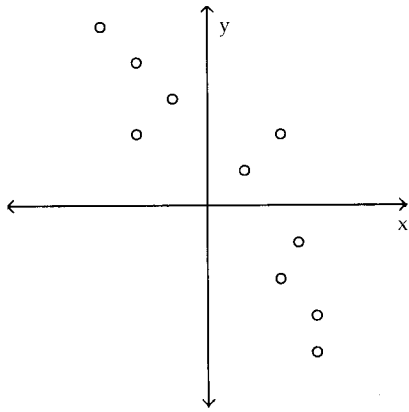
Determine which plot shows the strongest linear correlation.

20)

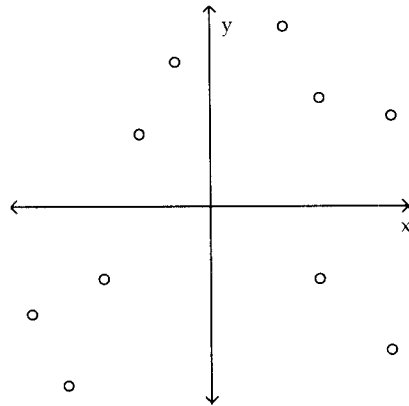
A)



B)



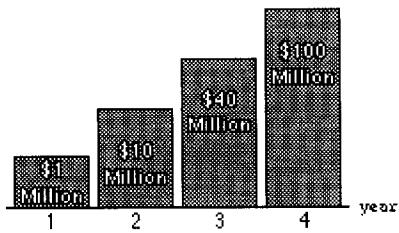
C)



SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Identify the abuse of statistics.

21) The graph shows the increases in a certain expenditure over a four-year period. What is wrong with the graph?



Provide an appropriate response.

22) Chapter 2 describes techniques for descriptive statistics. Explain the purpose of descriptive statistics. Refer to the three characteristics of a data set in your answer.

23) Sometimes probabilities derived by the relative frequency method differ from the probabilities expected from classical probability methods. How does the law of large numbers apply in this situation?

24) Describe in detail the sampling distribution of sample means. Refer specifically to the shape of the distribution.

25) Under what three conditions is it appropriate to use the t distribution in place of the standard normal distribution?

Answer Key

Testname: FINAL_2342_003.TST

- 1) Answer: B
- 2) Answer: A
- 3) Answer: C
- 4) Answer: B
- 5) Answer: C
- 6) Answer: B
- 7) Answer: C
- 8) Answer: B
- 9) Answer: D
- 10) Answer: A
- 11) Answer: B
- 12) Answer: B
- 13) Answer: A
- 14) Answer: A
- 15) Answer: A
- 16) Answer: A
- 17) Answer: D
- 18) Answer: B
- 19) Answer: B
- 20) Answer: B
- 21) Answer: The bars are not drawn in the correct proportions.
- 22) Answer: Answers will vary.
- 23) Answer: The law of large numbers states that as an experiment is repeated again and again, the relative frequency probabilities tend to approach the actual probabilities expected from the classical approach.
- 24) Answer: Samples of size n are taken from a population. Each sample mean is computed and the collection of sample means is the sampling distribution. The sample means are normally distributed.
- 25) Answer:
 - 1) $n \leq 30$
 - 2) σ is unknown, and
 - 3) the parent population is essentially normal