

**Math 281 Introduction to Statistics
Sample Exam 1 (Chapters 2 – 5)**

Name _____

Questions 1 – 16 are multiple choice.

Questions 17 and 18 are short answer (solve problem). You must show your work. Answers alone are not considered to be a complete solution. All work must be shown in an organized logical format

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

- 1) Elaine gets quiz grades of 80, 64, and 73. She gets a 72 on her final exam. Find the weighted mean if the quizzes each count for 10% and the final exam counts for 70% of the final grade.
A) 76.9 B) 72.3 C) 72.1 D) 72.2

- 2) A list of scores has a mean of 10 and a standard deviation of 3. Suppose the number 11 is inserted in the list. What best describes the change to the mean and standard deviation.
A) The mean increases and the standard deviation increases.
B) The mean decreases and the standard deviation decreases.
C) The mean increases and the standard deviation decreases.
D) The mean decreases and the standard deviation increases.

- 3) To get the best deal on a CD player, Tom called eight appliance stores and asked the cost of a specific model. The prices he was quoted are listed below:
\$249 \$367 \$439 \$116 \$270 \$169 \$124 \$402
Compute the sample standard deviation.
A) \$681,308.0 B) \$125.9 C) \$336.0 D) \$570,312.0

- 4) Which is better, a score of 92 on a test with a mean of 71 and a standard deviation of 15, or a score of 688 on a test with a mean of 493 and a standard deviation of 150?
A) A score of 688
B) A score of 92
C) Both scores have the same relative position.

- 5) The weights (in pounds) of 30 newborn babies are listed below. Find the 16th percentile, P_{16} .
5.5 5.7 5.8 5.9 6.1 6.1 6.4 6.4 6.5 6.6
6.7 6.7 6.7 6.9 7.0 7.0 7.0 7.1 7.2 7.2
7.4 7.5 7.7 7.7 7.8 8.0 8.1 8.1 8.3 8.7
A) 6.4 B) 4.8 C) 5.9 D) 6.1

Find the indicated probability.

- 6) A bag contains 4 red marbles, 3 blue marbles, and 5 green marbles. If two marbles are randomly selected from the bag without replacement, what is the probability that the first marble is blue?

A) $\frac{1}{4}$

B) $\frac{1}{5}$

C) $\frac{1}{9}$

D) $\frac{1}{3}$

- 7) A bag contains 4 red marbles, 3 blue marbles, and 5 green marbles (same box as above). If two marbles are randomly selected from the bag without replacement, what is the probability that the second marble is blue?

A) $\frac{3}{11}$

B) $\frac{1}{3}$

C) $\frac{1}{4}$

D) $\frac{2}{11}$

- 8) A bag contains 4 red marbles, 3 blue marbles, and 5 green marbles (same box as above). If two marbles are randomly selected from the bag without replacement, what is the probability that the first marble is blue **and** the second marble is blue?

A) $\frac{2}{9}$

B) $\frac{1}{2}$

C) $\frac{1}{16}$

D) $\frac{1}{22}$

- 9) A bag contains 4 red marbles, 3 blue marbles, and 5 green marbles (same box as above). If two marbles are randomly selected from the bag without replacement, what is the probability that the first marble is blue **or** the second marble is blue?

A) $\frac{5}{11}$

B) $\frac{7}{16}$

C) $\frac{1}{2}$

D) 1

- 10) In a blood testing procedure, blood samples from 6 people are combined into one mixture. The mixture will only test negative if all the individual samples are negative. If the probability that an individual sample tests positive is 0.12, what is the probability that the mixture will test positive?

A) 0.00000299

B) 0.536

C) 1.00

D) 0.0144

- 11) A sample of 100 wood and 100 graphite tennis rackets are taken from the warehouse. If 14 wood and 13 graphite are defective and one racket is randomly selected from the sample, find the probability that the racket is wood or defective.
- A) 0.135
 - B) 0.565
 - C) 0.57
 - D) There is insufficient information to answer the question.

If possible, determine whether the following is a probability distribution.

- 12) A police department reports that the probabilities that 0, 1, 2, 3, and 4 car thefts will be reported in a given day are 0.202, 0.323, 0.258, 0.138, and 0.055, respectively.
- A) Not a probability distribution.
 - B) Is a probability distribution.
 - C) Not enough information given to answer the question.

- 13) Suppose you pay \$1.00 to roll a fair die with the understanding that you will get back \$3.00 for rolling a 6 or a 3, nothing otherwise. What is your expected value?
- A) \$1.00
 - B) -\$1.00
 - C) \$0.00
 - D) \$3.00

- 14) Find the standard deviation for the given probability distribution.

x	P(x)
0	0.12
1	0.28
2	0.05
3	0.16
4	0.39

- A) 2.30
- B) 1.52
- C) 2.86
- D) 1.56

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

- 15) Choosing 5 people (without replacement) from a group of 62 people, of which 15 are women, keeping track of the number of men chosen.
- A) Procedure results in a binomial distribution.
 - B) Not binomial: there are too many trials.
 - C) Not binomial: the trials are not independent.
 - D) Not binomial: there are more than two outcomes for each trial.

Determine if the outcome is unusual. Consider as unusual any result that differs from the mean by more than 2 standard deviations. That is, unusual values are either less than $\mu - 2\sigma$ or greater than $\mu + 2\sigma$.

- 16) The Acme Candy Company claims that 60% of the jawbreakers it produces weigh more than .4 ounces. Suppose that 800 jawbreakers are selected at random from the production lines. Would it be unusual for this sample of 800 to contain 505 jawbreakers that weigh more than .4 ounces?
- A) No
 - B) Yes

SHORT ANSWER. Answer the questions in the space provided. Be sure to show your work and clearly indicate your final answer.

- 17) An airline estimates that 96% of people booked on their flights actually show up. If the airline books 64 people on a flight for which the maximum number is 62, what is the probability that the number of people who show up will exceed the capacity of the plane?
- 18) After being rejected for employment, Dave learns that the company which rejected him has hired only five men among the last 17 new employees. He also learns that the pool of applicants is very large, with an approximate equal number of qualified men and women. What is the the appropriate probability that would help him address the charge of gender discrimination?