Student: _____ **Date:** _____	**Instructor:** CHRISTOPHER FOLEY **Course:** STA2023 STATISTICS T R 9:30 AM 10:45 AM CHRISTOPHER FOLEY 565337 **Assignment:** Chapter 5

1. Determine whether the given procedure results in a binomial distribution. If it is not binomial, identify the requirements that are not satisfied.

    Surveying 100 college students and recording their favorite TV show

    Choose the correct answer below.

    ○ **A.** No, because the probability of success does not remain the same in all trials.
    ○ **B.** No, because there are more than two possible outcomes and the trials are not independent.
    ○ **C.** No, because there are more than two possible outcomes.
    ○ **D.** Yes, because all 4 requirements are satisfied.

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2. Determine whether the given procedure results in a binomial distribution. If it is not binomial, identify the requirements that are not satisfied.

    Surveying 200 college students and asking if they like pirates or ninjas better, recording Yes or No

    Choose the correct answer below.

    ○ **A.** No, because the probability of success does not remain the same in all trials.
    ○ **B.** No, because there are more than two possible outcomes and the trials are not independent.
    ○ **C.** Yes, because all 4 requirements are satisfied.
    ○ **D.** No, because there are more than two possible outcomes.

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3. The accompanying data table describes results from groups of 10 births from 10 different sets of parents. The random variable x represents the number of girls among 10 children. Complete the questions below.
    [1] Click the icon to view the data table.

    Use the range rule of thumb to identify a range of values containing the usual numbers of girls in 10 births.

    The maximum usual value is _____ . (Round to one decimal place as needed.)

    The minimum usual value is _____ . (Round to one decimal place as needed.)

    Based on the result, is 1 girl in 10 births an unusually low number of girls? Explain.

    ○ **A.** Yes, 1 girl is an unusually low number of girls, because 1 girl is outside of the range of usual values.

    ○ **B.** Yes, 1 girl is an unusually low number of girls, because 1 girl is less than the maximum usual value.

    ○ **C.** No, 1 girl is not an unusually low number of girls, because 1 girl is less than the minimum usual value.

    ○ **D.** Not enough information is given.

    1: More Info

x	P(x)
0	0.004
1	0.015
2	0.035
3	0.113
4	0.196
5	0.239
6	0.205
7	0.114
8	0.037
9	0.012
10	0.030

4. Assume that a procedure yields a binomial distribution with n trials and the probability of success for one trial is p. Use the given values of n and p to find the mean μ and standard deviation σ. Also, use the range rule of thumb to find the minimum usual value $\mu - 2\sigma$ and the maximum usual value $\mu + 2\sigma$.

    n = 1435, p = 3 / 5

    μ = _____

    σ = _____ (Round to one decimal place as needed.)

    $\mu - 2\sigma$ = _____ (Round to one decimal place as needed.)

    $\mu + 2\sigma$ = _____ (Round to one decimal place as needed.)

5. In a clinical trial of a cholesterol drug, 269 subjects were given a placebo, and 11% of them developed headaches. For such randomly selected groups of 269 subjects given a placebo, identify the values of n, p, and q that would be used for finding the mean and standard deviation for the number of subjects who develop headaches.

The value of n is _____ .

The value of p is _____ .
(Type an integer or a decimal.)

The value of q is _____ .
(Type an integer or a decimal.)

6. Multiple-choice questions each have four possible answers (a, b, c, d), one of which is correct. Assume that you guess the answers to three such questions.

a. Use the multiplication rule to find P(WCC), where C denotes a correct answer and W denotes a wrong answer.

P(WCC) = _____ (Type an exact answer.)

b. Beginning with WCC, make a complete list of the different possible arrangements of two correct answers and one wrong answer, then find the probability for each entry in the list.

P(WCC) – see above
P(CCW) = _____
P(CWC) = _____
(Type exact answers.)

c. Based on the preceding results, what is the probability of getting exactly two correct answers when three guesses are made?

_____ (Type an exact answer.)

7. Determine whether the value is a discrete random variable, continuous random variable, or not a random variable.
   a. The amount of snowfall in December in City A
   b. The weight of a T-bone steak
   c. The political party affiliation of adults in the United States
   d. The time it takes for a light bulb to burn out
   e. The number of textbook authors now sitting at a computer
   f. The number of people with blood type A in a random sample of 30 people

a. Is the amount of snowfall in December in City A a discrete random variable, a continuous random variable, or not a random variable?

   ○ **A.** It is a continuous random variable.
   ○ **B.** It is a discrete random variable.
   ○ **C.** It is not a random variable.

b. Is the weight of a T-bone steak a discrete random variable, a continuous random variable, or not a random variable?

   ○ **A.** It is a discrete random variable.
   ○ **B.** It is a continuous random variable.
   ○ **C.** It is not a random variable

c. Is the political party affiliation of adults in the United States a discrete random variable, a continuous random variable, or not a random variable?

   ○ **A.** It is a discrete random variable.
   ○ **B.** It is a continuous random variable.
   ○ **C.** It is not a random variable.

d. Is the time it takes for a light bulb to burn out a discrete random variable, a continuous random variable, or not a random variable?

   ○ **A.** It is a continuous random variable.
   ○ **B.** It is a discrete random variable.
   ○ **C.** It is not a random variable.

e. Is the number of textbook authors now sitting at a computer a discrete random variable, a continuous random variable, or not a random variable?

   ○ **A.** It is a continuous random variable.
   ○ **B.** It is a discrete random variable.
   ○ **C.** It is not a random variable.

f. Is the number of people with blood type A in a random sample of 30 people a discrete random variable, a continuous random variable, or not a random variable?

   ○ **A.** It is a discrete random variable.
   ○ **B.** It is a continuous random variable.
   ○ **C.** It is not a random variable.

8. A Gallup poll of 1236 adults showed that 12% of the respondents believe that it is bad luck to walk under a ladder. Consider the probability that among 30 randomly selected people from the 1236 who were polled, there are at least 2 who have that belief. Given that the subjects surveyed were selected without replacement, the events are not independent. Can the probability be found by using the binomial probability formula? Why or why not?

Choose the correct answer below.

○ **A.** Yes. Although the selections are not independent, they can be treated as being independent by applying the 5% guideline.

○ **B.** No. The selections are not independent.

○ **C.** Yes. There are a fixed number of selections that are independent, can be classified into two categories, and the probability of success remains the same.

○ **D.** No. The selections are not independent, and the 5% guideline is not met.

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9. Several psychology students are unprepared for a surprise true/false test with 11 questions, and all of their answers are guesses.
a. Find the mean and standard deviation for the number of correct answers for such students.
b. Would it be unusual for a student to pass by guessing (which requires getting at least 7 correct answers)? Why or why not?

a. $\mu =$ _____

$\sigma =$ _____ (Round to one decimal place as needed.)

b. Choose the correct answer below.

○ **A.** Yes, because 7 is within the range of usual values.

○ **B.** No, because 7 is within the range of usual values.

○ **C.** Yes, because 7 is below the minimum usual value.

○ **D.** Yes, because 7 is greater than the maximum usual value.

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10. Ted is not particularly creative. He uses the pickup line "If I could rearrange the alphabet, I'd put U and I together." The random variable x is the number of girls Ted approaches before encountering one who reacts positively. Determine whether the table describes a probability distribution. If it does, find its mean and standard deviation.

x	P(x)
1	0.002
2	0.019
3	0.105
4	0.251
5	0.481

Find the mean μ of the random variable x. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ **A.** $\mu =$ _____
(Round to one decimal place as needed.)

○ **B.** The table is not a probability distribution.

Find the standard deviation σ of the random variable x. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

○ **A.** $\sigma =$ _____
(Round to one decimal place as needed.)

○ **B.** The table is not a probability distribution.