

Quiz 8 Review Sheet

Name: _____

Binomial, Multinomial, and Poisson Distributions

Vocabulary—Use your notes to find the exact answer that fits each blank.

1. The symbol used to denote a factorial is _____.
2. A binomial experiment is a probability distribution that satisfies the following four requirements:
 - a. Each trial can have only _____ or outcomes that can be reduced to two outcomes. These outcomes can be considered as either _____ or _____.
 - b. There must be a _____ of trials.
 - c. The outcomes of each trial must be _____ of each other
 - d. The probability of a success must _____ for each trial.
3. The formula used to find the probability of a binomial distribution is _____.
4. A multinomial experiment is a probability distribution that satisfies the following 3 requirements:
 - a. Multinomial distributions are used if each trial in an experiment has _____.
 - b. This type of distribution can be used if the probabilities for each trial _____ and the outcomes are _____ for a fixed number of trials.
 - c. The events must also be _____.
5. The formula used to find the probability of a multinomial distribution is _____.
6. The symbol for the mean number of occurrences per unit is _____.
7. A Poisson distribution is used when the _____ and the _____ and when independent variables occur over time.

Work Problems—answer each question fully.

Find the probability of each problem (use the Binomial, Multinomial, or Poisson Distributions).

8. Suppose a card is drawn randomly from an ordinary deck of playing cards, and then put back in the deck. This exercise is repeated five times. What is the probability of drawing 1 spade, 1 heart, 1 diamond, and 2 clubs?

9. The number of road construction projects that take place at any one time in a certain city follows a Poisson distribution with a mean of 7. Find the probability that five road construction projects are currently taking place in the city.

10. Hospital records show that of patients suffering from a certain disease, 75% die of it. What is the probability that of 6 randomly selected patients with the disease, 2 will not recover?

11. The probability that a person will have 0, 1, or 2 dental checkups per year is 0.2, 0.5, and 0.3, respectively. If seven people are picked at random, what is the probability that two will have no checkups, four will have one checkup, and one will have two checkups in the next year?

12. A manufacturer of metal pistons finds that on the average, 12% of his pistons are rejected because they are either oversized or undersized. What is the probability that a batch of 10 pistons will contain no more than 2 rejects?

13. 800 batteries were checked last month after being manufactured by a company and found 90 defective batteries. What is the probability that this month in a random selection of batteries that 2 defective batteries will be found? This situation follows a Poisson distribution.

14. In a Gallop Poll, 35% of college students stated they believe in ghosts. Find the probability that out of 16 college students less than 4 said they believed in ghosts.