Math 2101 Journal Entries

Respond to each item, giving sufficient detail. *Your portfolio should be a collection of your best work and should also be very helpful to you as you prepare for exams.*

Unit II —

1.   List the three types or categories of probability.

   _____   _____   _____

2.   Give the classical probability formula for the probability of any event E, using S for the sample space.

   $P(E) =$

   Complete the odds formula.

   Odd for an event E =

3.   If E represents any event and $\overline{E}$ represents the complement of event E, then
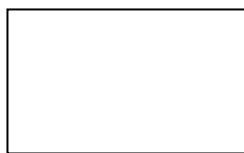
   $P(E) + P(\overline{E}) =$ _____ or $P(\overline{E}) =$ _____

   Using the given probability of an event, find the probability that it does not occur.

   $\dfrac{1}{6}$ _____   35% _____   0.9 _____

4.   Complete the formulas, and draw a Venn diagram to illustrate each rule.

   For events that are mutually exclusive, P(A or B) = _____

4. For events that are <u>not</u> mutually exclusive, P(A or B) = _____

5. If two events are independent, the probability of both occurring in succession is

    P(A and B) = _____

    This includes drawing balls out of a bag <u>with</u> replacement or tossing two coins.

    For example, toss 2 coins. Find the probability of a "head" on both.

    _____   _____

    If two events are dependent, the probability of both occurring in succession is

    P(A and B) = _____

    This includes drawing balls out of a bag <u>without</u> replacement.

    For example, a bag contains five red balls and eight white balls. If you select 2 balls at random without replacement, find the probability that you get 1 red ball and 1 white ball.

6. A permutation is an arrangement of n objects in a specific _____ .

    The number of permutations of n distinct objects taken r at a time is given by the formula:
    $$_nP_r = \text{_____}$$

    Give an example of the correct use of this formula.

7. Combinations involve the selection of distinct objects _____ (with or without) regard to order. Each selection is considered a _____ of the original set of objects.

    The number of combinations of n distinct objects taken r at a time is given by the formula:
    $$_nC_r = \text{_____}$$

    Give an example of the correct use of this formula.

8. Given a probability distribution with random variable, x, and corresponding probabilities, p(x). This distribution satisfies the two requirements: (1) $\sum p(x) =$ _____ and (2) _____ $\leq p(x) \leq$ _____ .

Complete the mean or expected value formula: $\mu = E(x) = \sum ($ _____ $)$

Given a probability distribution with random variable, x, and corresponding probabilities, p(x).

Complete the variance and standard deviation formulas:

$\sigma^2 =$ _____

$\sigma =$ _____ (either one will do!)

9. A binomial probability distribution has the following 4 requirements.

(1) The procedure has a fixed number of trials (or observations).
(2) The trials must be _____ (dependent or independent) .
(3) Each trial must have all outcomes classified into _____ (#) categories.
(4) The probability of a success remains the same in all trials.

P(success) = _____   P(failure) = _____ = q

The binomial probability formula for the probability of x successes in n trials is

P(x) = _____

For this distribution, give the formulas for the:

Mean: $\mu =$ _____
Variance: $\sigma^2 =$ _____
Standard deviation: $\sigma =$ _____

10. Briefly describe your favorite activity in class this unit.

Also include <u>self-assessment</u> of your effort in this course for this unit (including time spent on homework, time spent in the SSC, office hour help, etc.). Assess yourself on your level of understanding. Also provide <u>feedback</u> on how you feel the course, instruction, or textbook could be improved in this unit.

Do your best! Rise to the challenge! Live and learn!