

Test 4 Review

Name: _____ Date: _____ Period: _____

Over ISN pgs. 39-50

Your Test (pgs. 39-50) is on _____

Know your Vocab!!!

Random Variable
Discrete Variable
Continuous Variable
Probability Distribution

Population Mean
Population Standard Deviation
Expected Value
Binomial Distribution

Multinomial Distribution
Poisson Distribution
 $\mu \quad \sigma \quad \lambda \quad !$

Section 1: Probability Distributions and Graphs

Determine whether the distribution represents a probability distribution. If not, state why.

1)

X	1	2	3	4	5
P(X)	$\frac{3}{10}$	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{1}{10}$

2)

X	5	10	15	20
P(X)	0.7	0.3	0.1	-0.1

3) A study was conducted to determine the number of radios each household has. The data are shown here. Construct a probability distribution for the data and draw a graph.

Number of Radios	Frequency
0	5
1	30
2	45
3	12
4	8

4) A box contains five pennies, three dimes, one quarter, and one half-dollar. Construct a probability distribution for the data and draw a graph.

Section 2: Find the mean and standard deviation for the following probability distributions.

5) At a small community library, the number of visitors per hour during the day has the distribution shown. Find the mean and standard deviation.

X	8	9	10	11	12
P(X)	0.15	0.25	0.29	0.19	0.12

6) The number of inquiries received per day for a college catalog is distributed as shown. Find the mean and standard deviation.

X	22	23	24	25	26	27
P(X)	0.08	0.19	0.36	0.25	0.07	0.05

Section 3: Expected Value.

Construct a probability distribution using net gain, and find the expected value.

7) A cash prize of \$5000 is to be awarded at a PTSA raffle. If 2500 tickets are sold at \$5 each, find the expected value of the gain.

8) A box contains ten \$1 bills, five \$2 bills, one \$10 bill, and one \$100 bill. A person is charged \$20 to select one bill. Find the expected value.

9) 700 raffle tickets are sold for \$1.50 each. A grand prize of \$600 will be selected at random. Find the expected value if you purchase four tickets.

Section 4: Binomial Distribution

10) If 10% of the people who are given a certain drug experience dizziness, find these probabilities for a sample of 15 people who take the drug.

a. Fewer than two people will become dizzy

b. Exactly three people will become dizzy

c. At most four people will become dizzy

11) If 20% of the people in a community use the emergency room at a hospital in one year, find the probability that at most three used the emergency room for a sample of 10 people.

Section 5: Multinomial Distribution

12) The probabilities that a person will make 0, 1, 2, or 3 errors on an insurance claim are 0.70, 0.20, 0.08, and 0.02 respectively. If 20 claims are selected, find the probability that 12 will contain no errors, 4 will contain one error, 3 will contain 2 errors, and 1 will contain 3 errors.

13) In a Christmas display, the probability that all lights are the same color is 0.50; that 2 colors used is 0.40; that 3 or more colors are used is 0.10. If a sample of 10 displays is selected, find the probability that 5 will have only one color of light, 3 will have two colors, and 2 will have three colors.

Section 6: Poisson Distributions

14) If 4% of the population carries a certain genetic trait, find the probability that in a sample of 100 people, there are exactly 8 people who have the trait. Assume the distribution is approximately Poisson.

15) The number of boating accidents on Lake Hartwell follows a Poisson distribution. The probability of an accident is 0.003. If there are 1000 boats on the lake during a summer month, find the probability that there will be six accidents.

16) 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 exactly four road construction projects are currently taking place in the city.