

Quiz 4

Math 1040-1

June 22, 2012

Name: _____

Directions: Show all work for full credit. Clearly indicate all answers. Simplify all mathematical expressions completely. Unless otherwise directed, give each decimal approximation rounded to at least three decimal places.

Formulas:

$${}_nP_r = \frac{n!}{(n-r)!}$$

Ways to order n objects with n_1 alike, n_2 alike, \dots , and n_k alike = $\frac{n!}{n_1!n_2!\dots n_k!}$

$${}_nC_r = \frac{n!}{(n-r)!r!}$$

$$\sigma^2 = \sum (x - \mu)^2 P(x)$$

1. A company that makes cartons finds that the probability of producing a carton with a puncture is 0.05, the probability that a carton has a smashed corner is 0.08, and the probability that a carton has a puncture and has a smashed corner is 0.004.

Are the events “selecting a carton with a puncture” and “selecting a carton with a smashed corner” mutually exclusive? Find the probability that a carton chosen at random has a puncture or a smashed corner.

2. In a state lottery, you choose 5 different numbers out of 40. To win the top prize, your numbers must match the 5 numbers chosen by the lottery in any order. You purchase one lottery ticket. What is the probability that you will win the top prize?

3. Find the number of distinguishable ways that the letters in “statistics” can be arranged.

4. Let x represent the amount of snow (in inches) that fell in Nome, Alaska, last winter. Determine whether x is discrete or continuous. Explain your reasoning.

5. The number of televisions per household in a small town of 2600 households are:

Televisions	0	1	2	3
Households	26	442	728	1404

- (a) Let x represent the number of televisions for a randomly selected household. Construct a probability distribution for the above data:

x	0	1	2	3
$P(x)$				

- (b) Calculate the mean of the probability distribution.

- (c) Calculate the standard deviation of the probability distribution.