Math 1040 Exam 2 Name________________________________

Time Limit: 90 minutes

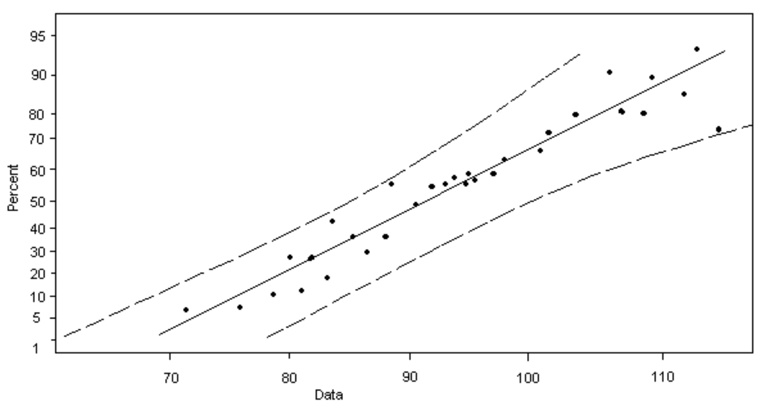
Any calculator is okay, but no computers, cell phones or other hand-held devices are allowed. Tables and formulas are attached to the back of the exam. Not other formulas, tables or notes are allowed. All problems are weighted equally.

1) Circle the appropriate response(s) to each of the following.

A. The normal density curve is symmetric about
   a) A point located one standard deviation from the mean
   b) The horizontal axis
   c) Its mean
   d) An inflection point

B. The area under a standard normal density curve with mean of 0 and standard deviation of 1 is
   a) $\mu + 3\sigma$
   b) infinite
   c) 1
   d) $\mu + 2(3\sigma)$

2) Determine whether the following normal probability plot indicates that the sample data could have come from a population that is normally distributed.



a) not normally distributed
b) normally distributed

3) The probability that a region prone to hurricanes will be hit by a hurricane in any single year is $\frac{1}{10}$. What is the probability of a hurricane at least once in the next 5 years?

a) 0.00001
b) $\frac{1}{2}$
c) 0.99999
d) 0.40951

4) Suppose a basketball player is an excellent free throw shooter and makes 93% of his free throws (i.e., he has a 93% chance of making a single free throw). Assume that free throw shots are independent of one another. Suppose this player gets to shoot three free throws. Find the probability that he misses all three consecutive free throws.

a) 0.8044
b) 0.0003
c) 0.1956
d) 0.9997

5) The peak shopping time at home improvement store is between 8:00am-11:00 am on Saturday mornings. Management at the home improvement store randomly selected 100 customers last Saturday morning and decided to observe their shopping habits. They recorded the number of items that each of the customers purchased as well as the total time the customers spent in the store. Identify the types of variables recorded by the home improvement store.

a) number of items - continuous; total time - discrete
b) number of items - discrete; total time - discrete
c) number of items - continuous; total time - continuous
d) number of items - discrete; total time - continuous

6) Circle the appropriate response(s) to each of the following.

A. Which of the following cannot be the probability of an event?
   a) 0.001
   b) -2
   c) $\frac{\sqrt{3}}{3}$
   d) 0

B. An unusual event is an event that has a
   a) Probability of 1
   b) Negative probability
   c) Probability which exceeds 1
   d) Low probability of occurrence

7) Consider the data in the table shown which represents the marital status of males and females 18 years or older in the United States in 2003. Determine the probability that a randomly selected U.S. resident 18 years or older is divorced or a male.

	Males (in millions)	Females (in millions)	Total (in millions)
Never married	28.6	23.3	51.9
Married	62.1	62.8	124.9
Widowed	2.7	11.3	14.0
Divorced	9.0	12.7	21.7
Total (in millions)	102.4	110.1	212.5

Source: U.S. Census Bureau, Current Population reports

a) 0.58
b) 0.54
c) 0.04
d) 0.50

8) Determine the area under the standard normal curve that lies between: z = -2 and z = -0.5. Round to four decimal places.

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9) The probability that a house in an urban area will develop a leak is 6%. If 82 houses are randomly selected, what is the probability that none of the houses will develop a leak?

Show your work below using the binomial probability distribution formula.

Round your solution to three decimal places and write it below.

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10) A single die is rolled twice. The set of 36 equally likely outcomes is

{ (1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6), (5, 1), (5, 2), (5, 3), (5, 4), (5, 5), (5, 6), (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6) }.

What is the probability of getting two numbers whose sum is greater than 9 and less than 13? *(Write answer as a fraction.)*

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11) A legendary football coach was known for his winning seasons. He consistently won nine or more games per season. Suppose x equals the number of games won up to the halfway mark (six games) in a 12-game season. If this coach and his team had a probability p = 0.7 of winning any one game (and the winning or losing of one game was independent of another), then the probability distribution of the number x of winning games in a series of six games is:

x	P(x)
0	0.000729
1	0.010206
2	0.059535
3	0.185220
4	0.324135
5	0.302526
6	0.117649

Find the expected number of winning games in the first half of the season for this coach's football teams.

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12) A group consists of 6 men and 5 women. Three people are selected to attend a conference.

A. In how many ways can 3 people be selected from this group of 11?

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B. In how many ways can 3 men be selected from the 6 men?

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C. Find the probability that the selected group will consist of all men. *(Write answer as a fraction.)*

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13) In how many different ways can a ski club consisting of 20 people select a person for its officers? The positions available are president, vice president, treasurer, and secretary. No person can hold more than one positions and the each office is filled in order.

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14) Circle the appropriate response(s) to each of the following.

A. Find P(A or B) given that P(A) = 0.1, P(B) = 0.4, and A and B are mutually exclusive.
   a) 0.04
   b) 0
   c) 0.9
   d) 0.5

B. Find P(A and B) given that P(A) = 0.1, P(B) = 0.4, and A and B are independent.
   a) 0.9
   b) 0
   c) 0.5
   d) 0.04

15) The amount of corn chips dispensed into a 48-ounce bag by the dispensing machine has been identified as possessing a normal distribution with a mean of 48.5 ounces and a standard deviation of 0.2 ounce. What chip amount represents the 67th percentile for the bag weight distribution? Round to two decimal places.

z-score representing 67th percentile ____________________

chip amount representing 67th percentile ____________________