Math 160
Binomial Distribution Quiz 7
Due Tuesday April 9th **Name:** _____

Multiple Choice Section. **For questions, 1 through 6, choose the one alternative that best completes the statement or answers the question.**

1. A machine has 12 identical components which function independently. The probability that a component will fail is 0.2. The machine will stop working if more than three components fail. Find the probability that the machine will be working.

   A) 0.795 B) 0.927 C) 0.133 D) 0.206

   1. _____

2. A company purchases shipments of machine components and uses this acceptance sampling plan: Randomly select and test 30 components and accept the whole batch if there are fewer than 3 defectives. If a particular shipment of thousands of components actually has a 6% rate of defects, what is the probability that this whole shipment will be accepted?

   A) 0.576 B) 0.277 C) 0.732 D) 0.165

   2. _____

3. A car insurance company has determined that 9% of all drivers were involved in a car accident last year. Among the 11 drivers living on one particular street, 3 were involved in a car accident last year. If 11 drivers are randomly selected, what is the probability of getting 3 or more who were involved in a car accident last year?

   A) 0.057 B) 0.943 C) 0.424 D) 0.070

   3. _____

4. An airline estimates that 90% of people booked on their flights actually show up. If the airline books 71 people on a flight for which the maximum number is 69, what is the probability that the number of people who show up will exceed the capacity of the plane?

   A) 0.022 B) 0.001 C) 0.004 D) 0.005

   4. _____

5. According to a college survey, 22% of all students work full time. Find the mean for the number of students who work full time in samples of size 16.

   A) 3.5 B) 2.8 C) 0.2 D) 4.0

   5. _____

6. According to a college survey, 22% of all students work full time. Find the standard deviation for the number of students who work full time in samples of size 16.

   A) 1.7 B) 3.5 C) 2.6 D) 1.9

   6. _____

Binomial Experiment

People with type O-negative blood are said to be "universal donors." About 7% of the U.S. population has this blood type. Suppose that 30 people show up at a blood drive. Let x =the number of universal donors among a random group of 30 people.

n	This is the number of trials. For this example, $n = 30$ (the number of blood donors).
p	This is the "success" probability. For this example, $p = 0.07$ (the probability that a randomly selected American has type O-negative blood). Note that p must be in decimal form.
x	This is the number of "successes," or type-O negative donors

7. Using the range rule of thumb, what is range of usual x values for this blood drive?

7. _____

8. Find the probability that ***none*** of the people who show up are type-O negative.

8. _____

9. Find the probability that ***exactly*** 4 people show up who are type-O negative.

9. _____

10. Find the probability, $P(x \leq 4)$.

10. _____

11. Find the probability, $P(x = 4)$.

11. _____

Find the probability that the number of type-O negative donors who show up:

12. ***will not exceed 5***

12. _____

13. ***is between 4 and 6***.

13. _____