

Math 1600, Section 7, Fall 2012 – Statistics  
Quiz 2 Review Sheet (Chapters 5, 6, and 7) – October 29, 2012

1. Define a **random variable**.
  2. Define a probability distribution.
  3. Give an example of a discrete random variable.
  4. Give an example of a continuous random variable.
  5. What is a **Bernoulli Trial**?
  6. What is a probability model?
7. A company that sells magazine subscriptions announces a sweepstakes to attract new customers. The prizes and chances of winning are listed on the advertisement flyer as:

Prize	Chance
\$50,000	1 in 250,000
\$5,000	1 in 50,000
\$100	1 in 500

Calculate your expected winnings.

8. The number of days,  $X$ , that it takes the post office to deliver a letter between City A and City B has the probability distribution:

$X$	$f(x)$
3	.4
4	.4
5	.2

- a. Find the expected number of days for the post office to deliver a letter between City A and City B.
  - b. Find the standard deviation of the number of days for the post office to deliver a letter between City A and City B.
  - c. Draw the probability histogram and locate the mean on the histogram.
9. Calculate the mean and the standard deviation of the binomial distribution with:  
 $n = 14$  and  $p = .4$
10. Let  $X$  be the number of successes in the 14 trials. Using the **formula**, with  $p = .4$ , compute:  
 $P[X = 6]$
11. If  $X$  is normally distributed with a mean on 100 and a standard deviation of 8, find
- a.  $P[X < 107]$
  - b.  $P[X > 90]$
  - c.  $P[96 < X < 106]$
12. If  $X$  is normally distributed with a mean on 100 and a standard deviation of 5, find  $b$  such that
- a.  $P[X < b] = .6700$
  - b.  $P[X > b] = .0110$
13. The weights of apples served in a restaurant are normally distributed with a mean of 5 ounces and standard deviation of 1.6 ounces. What is the probability that the next person served will be given an apple that weighs less than 4 ounces?

14. A random sample of size 60 is taken from a population having a mean of 43 and a standard deviation of 5. The shape of the population distribution is unknown.

a. What can you say about the probability distribution of the sample mean  $\bar{X}$ ?

b. Find the probability that  $\bar{X}$  will exceed 45.6.

15. The amount of sulfur in daily emissions from a power plant has a normal distribution with a mean of 96 pounds and a standard deviation of 20 pounds. A random sample of five days is taken:

a. What can you say about the probability distribution of the sample mean  $\bar{X}$ ?

b. Find the probability that the total amount of sulfur emissions will exceed 500 pounds.