

Math – 227: Test – 3
Los Angeles City College – Fall 2007

1. Find the following probabilities for the standard normal random variable z : (15 pts.)
 - a. $P(z > 1.43)$
 - b. $P(-1.15 \leq z \leq 0.5)$
 - c. $P(z < -2.45)$

2. Find a z score call it z_0 , such that: (10 pts.)
 - a. $P(z > z_0) = 0.354$
 - b. $P(z < z_0) = 0.539$
 - c. $P(-z_0 < z < z_0) = 0.684$

3. Suppose x is a normally distributed random variable with $\mu = 20$ and $\sigma = 8$. Find a value of the random variable, call it x_0 , such that: (30 pts.)
 - a. 10% of the values of x are less than x_0
 - b. 1% of values are greater than x_0
 - c. Find the x value corresponding to P_{10}
 - d. Find the x value corresponding to Q_3

4. The board of examiners that administers the real estate broker's examination in a certain state found that the mean score on the test was 435 and the standard deviation was 72. If the board wants to set the passing score that only the top 30% of all applicants pass, what is the passing score? Assume that scores are normally distributed. (10 pts.)

5. It is reported that 25% of the country's 91,061,100 households are inhabited by one person. If 1,000 randomly selected homes are to participate in a Nielsen Survey to determine television ratings, find the probability that no more than 250 of these homes are inhabited by one person. (15 pts.)

6. This past year, an elementary school began using a new method to teach arithmetic to first graders. A standardized test, administered at the end of the year, was used to measure the effectiveness of the new method. The distribution of the past scores on the standardized test produced a mean of 75 and a standard deviation of 10.
 - a. If the new method is no different from the old method, what is the probability that the mean score of 36 students will be greater than 79?
 - b. What assumptions must be satisfied to make the answer valid? (15 pts.)

7. If a couple have 4 children. Set up a probability distribution for number of boys in four births. Calculate the mean and standard deviation for this distribution. (15 pts.)

8. If there is a biased coin that has three more times chance of giving tail than heads, set up a probability distribution to for number of tails in 4 trials. (10 pts.)

9. Find the following probabilities using a binomial distribution: (15 pts.)
- a) Probability of exactly 45 boys in 70
 - b) Probability of less than 5 boys in 70 births.
 - c) Probability of no boys.
10. If a door-to-door salesman has a success rate of 0.35 in selling his product and in a day he can visit 10 homes per day, find the following probabilities for one day of work: (15 pts.)
- a) Probability of at least 8 sales in a day.
 - b) Probability of at most 3 sales in day.
 - c) Probability of 10 sales in a day