

# QUIZ 3 (CHAPTER 6)

MATH 119 – SPRING 2013 – KUNYUKI  
105 POINTS TOTAL, BUT 100 POINTS = 100%

**Show all work, simplify as appropriate, and use “good form and procedure” (as in class).**

**Box in your final answers!**

**No notes or books allowed. A scientific calculator is allowed.**

- You may detach the attached tables and write on them, but turn them in with your test. Nothing you write on the tables will be graded.
- Round off  $z$  scores to 2 decimal places; otherwise, write exact answers or round off calculations to at least four decimal places or at least four significant digits, whichever is more convenient.

- 1) (2 points). What is the mean of the standard normal distribution?
  
- 2) (2 points). What is the standard deviation of the standard normal distribution?
  
- 3) (2 points). One million people have taken a particular standardized test. The distribution of test scores has mean 75 points and standard deviation 6 points. We will draw a random sample of 50 people who took the test and analyze their scores. Which of the following statements is true, based on the Central Limit Theorem (CLT)? Box in one:
  - i. The probability distribution for the average test score for the 50 sampled people will be approximately normally distributed with a mean of 75 points.
  - ii. The probability distribution for the average test score for the 50 sampled people will be approximately normally distributed with a standard deviation of 6 points.
  
- 4) (2 points). Based on our discussion in class, is it true that all binomial distributions can be approximated well by normal distributions? Box in one:
 

Yes	No
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- 5) (38 points total). The starting salaries of chemical engineers in a state are approximately normally distributed with a mean of \$58,500 and a standard deviation of \$7,400. Do not use continuity corrections for these problems.
  - a) What percent of the starting salaries are less than \$50,000? Write your answer to the nearest hundredth (that is, to two decimal places) of a percent. (8 points)

Reminder: The starting salaries of chemical engineers in a state are approximately normally distributed with a mean of \$58,500 and a standard deviation of \$7,400. Do not use continuity corrections for these problems.

b) What percent of the starting salaries are between \$60,000 and \$65,000? Write your answer to the nearest hundredth of a percent. (16 points)

c) A college claims that its chemical engineering graduates have starting salaries in the top 10% of the state's starting chemical engineering salaries. Among the state's starting chemical engineering salaries, find the salary that separates the top 10% from the rest. Write your answer to the nearest dollar. (14 points)

**IN THE FOLLOWING PROBLEMS, WRITE YOUR ANSWERS OUT TO FOUR DECIMAL PLACES.**

6) (34 points total). The heights of adult males are approximately normally distributed with a mean of 69.0 inches and a standard deviation of 2.8 inches.

Do not use continuity corrections for these problems.

a) Find the probability that a randomly selected adult male is between 66.0 inches and 72.0 inches in height. (15 points)

b) If six adult males are randomly selected, what is the probability that their average height is between 66.0 inches and 72.0 inches? (19 points)

7) (25 points). According to a CNN poll taken after the first presidential debate of 2012, 25% of debate watchers thought that President Obama won. Let's say 360 debate watchers are randomly selected. Based on the poll results, find the probability that more than 100 of those selected individuals thought that President Obama won. Use a normal approximation to a binomial distribution, and use a continuity correction. Show why the normal approximation is appropriate based on the rules given in class.