

Practice for FINAL EXAM

Math 102 / Core 143

A. Robertson

- We have three boxes with unknown numbers in each. From each box we draw, with replacement, 1000 times. From Box I we want to investigate the sum; from Box II we want to investigate the average; from Box III we want to investigate the product. We can use the Normal curve to approximate the results for
 - Box I only
 - Box I and II only
 - Box I and III only
 - All three boxes
- A student performs a hypothesis test comparing 115 samples against an established norm. She gets a test statistics of 2.14. Which of the following is correct at a significance level of 5%?
 - The p-value is 1.6% so we conclude that our sample is different from the established norm
 - The p-value is 1.6% so we conclude that our sample is *not* different from the established norm
 - The p-value is 2.5% so we conclude that our sample is different from the established norm
 - The p-value is 2.5% so we conclude that our sample is *not* different from the established norm
- Roll a fair 8-sided die 64 times. Find the 84th percentile for the number of threes rolled.
 - 8.00
 - 9.25
 - 10.65
 - 12.80
- You have in your possession a biased coin which has probability of landing heads $1/3$.
 - Find the chance that at least one head appears on five consecutive tosses.
 - 32.9%
 - 50.0%
 - 66.7%
 - 86.8%
 - Find the chance of getting exactly 8 heads out of 10 tosses.
 - 99.7%
 - 30.0%
 - 5.2%
 - 0.3%
- A remarkable (fictitious) study result in Norway found a correlation between a person's IQ and their height. The average IQ of the study group was 100 with a standard deviation of 15, while the average height of the study group was 66 inches, with a standard deviation of 6 inches. The remarkable results was that the researchers found a correlation coefficient of $r = .3$.
 - What do you predict for the height of a person in the study group with a 110 IQ?
 - 79.3 in
 - 72.0 in
 - 68.9 in
 - 67.2 in
 - What do you predict for the IQ of a person in the study group who is 6 feet tall?
 - 98.6
 - 104.5
 - 126.2
 - 150.0
- A gambling game is based on a simplified roulette wheel. This wheel has two red slots, two black slots, and one green slot. You bet \$1 on red. If red shows you get back \$2, otherwise you lose your \$1. Assuming each slot is equally likely, what is the approximate chance of not losing any money on 100 spins of the wheel?
 - 2%
 - 5%
 - 10%
 - 25%
- Consider the box: $[0, 1]$. We are going to draw 9 times, with replacement, and look at the product of the draws (multiply all numbers drawn together). The chance that the product is equal to 1 is
 - 0.2%
 - 1.1%
 - 97.9%
 - 100%

8. We want to test if the amount of Carbon Monoxide (CO) in the air (in parts per million) is higher than 70. We take 5 readings and get: 78, 83, 68, 72, 88. At a significance level of 1%, would you conclude that the amount of CO in the air is higher than 70ppm?

9. In a small village of 1000, 200 people are surveyed to see if they watch the tv show "Survivor." From this survey it was found that 160 people watch "Survivor." Find a 95% confidence interval for the percentage of people in the village that watch "Survivor."

10. A student has a set of data that she believes to be correlated. However, the student (correctly) calculated the correlation coefficient to be $r = .013$ and she concludes that the data is not correlated in any way. Do you agree with her conclusion? State your reasoning. Also, if the correlation coefficient were based on a sample with size 102, would you conclude, at a significance level of 5%, that $r = 0$?

11. We tally some categorical data according to gender and political affiliation. We have the following table:

	Democrat	Republican	Other
Female	104	79	12
Male	113	128	4

Based on this data, find the following probabilities.

i) Probability that a person is female, given that the person is Republican.

ii) Probability that a person is a Democrat, given that the person is male.

iii) Probability that a person is "Other."

12. A recent tv commercial claims that a higher percentage of students get A's when they used the new "Hookd On Fonix" than those students that did not use it. To test this claim we take a sample of 30 students who have used "Hookd On Fonix" and a sample of 50 student who have not used "Hookd On Fonix." We found:

Of those that used "Hookd On Fonix," 18 received A's and 12 did not.

Of those that have not used "Hookd On Fonix," 25 received A's and 25 did not.

At a significance level of 5%, do you agree with the commercial's claim?

13. Consider a fair 4 sided die (with sides 1,2,3, and 4). If we roll this die 121 times, what is the approximate probability that we roll at least thirty-five 2s?

Note: The final exam will be 25 multiple choice questions based on all material covered in the class.