

Name: _____
Statistics: Normal Distribution – Worksheet 2

Using R – Create a sample of 1000 standard normal random variables.

1. What percentage of random variables fall below 1, in other words, what is the $P(X < 1)$?

2. Refer to the z-table at the front of the book and find the z-value for 1.00. _____
3. Are 1 and 2 similar? Yes or No
4. Using R, what percentage of random variables fall below -1.55?

5. Using the z-table, find $P(X < -1.55)$? _____
6. What is the $P(X > -1.55)$? _____
7. What is the $P(X = -1.55)$? _____

(FOR QUESTIONS 8-22) The average time it takes a group of adults to complete a certain achievement test is 46.2 minutes. The standard deviation is 8 minutes. Assume the variable is normally distributed.

8. How would you define the above distribution? $N(\quad , \quad)$
9. Simulate 1000 random variables of the above distribution, and then calculate what percentage of random variables that fall below 43 minutes? _____
10. What percentage fall above 43 minutes? _____
11. Using R, create a histogram of the above distribution. Then using this histogram, sketch a density curve. Clearly mark the center and the standard deviations.
12. On your sketch, what is the area below the density curve? _____
13. What is the area to the left of 46.2? _____
14. What is the area to the right of 43? _____
15. Find the z value of 43 using the equation in the Introductory Statistics Notes?

16. Using the z table – find the area to the left of 43. _____

17. Is this answer similar to that found in question 2? _____
18. Using R, calculate the probability that a random variable falls between 46 and 48.

19. Using the z-table, find $P(X < 48)$. _____
20. Using the z-table, find $P(X > 46)$. _____
21. Using your answers from 19 and 20, find the $P(46 < X < 48)$. Remember, probability is equivalent to area. _____
22. Does your answer in 18 similar to that found in 21? Yes or No