

Chapter 5 Homework Worksheet

Section 5.1

Suppose that a randomly selected used battery outputs voltages from 0 volts to 3 volts, uniformly distributed, depending on how much it has been used.

Let x = random battery voltage.

For these problems use the example from the lesson video that covers a problem where we build a rectangle and find its height.

1. Graph the probability distribution for x , stating the height of the density function.
2. Given that the mean of a uniform distribution is the midpoint of its range, state the formula for the mean.
3. Compute $P(x > 1.3)$.
4. Compute $P(x < 2.5)$.
5. Compute $P(0.8 < x < 2.7)$.

Section 5.2

Use your calculator (see the lesson videos) to find the following probabilities associated with the standard normal random variable, z .

1. Compute $P(z < 0)$ _____
2. Compute $P(z < 3.18)$ _____
3. Compute $P(z > 2.49)$ _____
4. Compute $P(-3.05 < z < 0.73)$ _____
5. Compute $P(z < 4.06)$ _____
6. Compute $P(z > 2.65)$ _____
7. Compute $P(z < 2.65)$ _____
8. Compute $P(z > 1.27)$ _____
9. Compute $P(z < 1.27)$ _____
10. Compute $P(-1.27 < z < 2.65)$ _____
11. Compute $P(1.53 < z < 2.09)$ _____

Use your calculator (see the lesson videos) to find the approximate z -score associated with the given area under the standard normal distribution.

16. Right tail area equal to 0.01 _____
17. Right tail area equal to 0.05. _____
18. Right tail area equal to 0.06 _____
19. Right tail area equal to 0.04. _____
20. Left tail area equal to 0.04. _____

Section 5.3

IQ Scores are approximately normal in their distribution, with a mean equal to 100, and a standard deviation equal to approximately 15. Let x represent a randomly selected IQ score, and compute the following probabilities. Assume that x is a continuous random variable.

1. $P(x < 119)$

2. $P(x < 81)$

3. $P(x > 133)$

4. $P(x > 77)$

5. $P(82 < x < 91)$

6. $P(110 < x < 139)$

Heights of adult males are normally distributed with a mean of 69 inches, and a standard deviation of 3 inches. Use a p-value to determine whether the given adult male heights are significantly high or low, as indicated. Recall that $x = a$ is significantly high if $P(x > a)$ is small (less than about 5%), and $x = a$ is significantly low if $P(x < a)$ is small (again, less than about 5%).

11. Is $x = 73.5$ significantly high?

12. Is $x = 78.3$ significantly high?

13. Is $x = 60.2$ significantly low?

19. What is the probability that an adult male is greater than 74.5 inches?

The mean GPA for students at a prestigious university is normally distributed with a mean of 3.463 and a standard deviation of 0.298. Use these facts to answer the following questions.

20. Supposing that students who graduate with honors need a GPA of 3.5 or higher, what proportion of students at UCLA graduate with honors? (Hint: Proportions are the same as probabilities, so find the z-score and change it to a probability.)

24. What GPA is required to put a student in the top 10% of GPA scores?