Name: Notes

SA402 · Dynamic and Stochastic Models   Fall 2019 · Uhan

Quiz – 28 August 2019

Instructions. You have 15 minutes to complete this quiz. You may use your
calculator. You may <u>not</u> use any other materials (e.g., notes, homework,
books).

Problem	Weight	Score
1	1	
2	1	
3	1	
4	1	
5	1	
Total		/ 50

For Problems 1 and 2, consider the random variable X with the following pdf:

$$f_X(a) = \begin{cases} 0 & \text{if } a < -2, \\ \frac{3a^2}{16} & \text{if } -2 \le a \le 2, \\ 0 & \text{if } a > 2. \end{cases}$$

Problem 1. What is the probability that $-1 \le X \le 1$?

- Take a look at Lesson 2 to see how to compute probabilities on intervals using a pdf.

Problem 2. Professor I. M. Wright peeks over your shoulder and declares,

"The probability that $X = 1$ is $\frac{3}{16}$, since $f_X(1) = \frac{3}{16}$."

Is Professor Wright correct? Briefly explain.

- A few things to think about:
  - What kind of random variable has a pdf?
  - How do you compute probabilities for such a random variable?

For Problems 4 and 5, consider the random variable X with the following cdf:

$$F_X(a) = \begin{cases} 0 & \text{if } a < -2, \\ 2/9 & \text{if } -2 \le a < 3, \\ 3/9 & \text{if } 3 \le a < 7, \\ 7/9 & \text{if } 7 \le a < 12, \\ 1 & \text{if } a \ge 12. \end{cases}$$

Problem 3. What is the probability that $1 < X \le 8$?

- Take a look at Lesson 2 to see how to compute probabilities on intervals using a cdf.

Problem 4. What is the probability that $X = 3$?

- For a hint, take a look at Problem 1a from the Lesson 2 Exercises.

Problem 5. Is X discrete or continuous? Briefly explain.

- Take a look at Lesson 2 to see how the cdf of a random variable is related to whether the random variable is discrete or continuous.