

Name:

### Quiz 1 – 8/31/2022

**Instructions.** You have 15 minutes to complete this quiz. You may use your plebe-issue calculator. You may not use any other materials (e.g., notes, homework, website).

Show all your work. To receive full credit, your solutions must be completely correct, sufficiently justified, and easy to follow.

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:

$$f_X(a) = \begin{cases} 0 & \text{if } a < 0, \\ \frac{3}{8}a^2 & \text{if } 0 \leq a \leq 2, \\ 0 & \text{if } a > 2. \end{cases}$$

**Problem 1.** What is the probability that  $0 \leq X \leq 1$ ?

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

“The probability that  $X = 1$  is  $\frac{3}{8}$ , since  $f_X(1) = \frac{3}{8}$ .”

Is Professor Wright correct? Briefly explain.

For Problems 3, 4 and 5, consider the random variable  $X$  with the following cdf:

$$F_X(a) = \begin{cases} 0 & \text{if } a < 1, \\ 2/7 & \text{if } 1 \leq a < 3, \\ 5/7 & \text{if } 3 \leq a < 4, \\ 6/7 & \text{if } 4 \leq a < 8, \\ 1 & \text{if } a \geq 8. \end{cases}$$

**Problem 3.** What is the probability that  $2 < X \leq 6$ ?

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

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