

Full Name: _____

Student No: _____

Grade:

For each answer, **provide a short argument.**

1. (3 points) Let X be a random variable with cumulative distribution function

$$F(x) := \mathbb{P}(X \leq x) = \begin{cases} 0 & \text{if } x < -2, \\ 0.25 & \text{if } -2 \leq x < -1, \\ 0.6 & \text{if } -1 \leq x < 1, \\ 0.9 & \text{if } 1 \leq x < 2, \\ 1 & \text{if } 2 \leq x. \end{cases}$$

- (a) What is the probability that $-1.5 < X \leq 1.5$?

Answer:

- (b) What is the probability that $X \geq 1$?

Answer:

- (c) Find the expected value of X .

Answer:

2. (2 points) We distribute 22 books into 9 boxes at random.

(a) What is the probability that box #1 contains more than 3 books?

Answer:

(b) What is the expected number of boxes that contain more than 3 books?

[Hint: Write the number of boxes that contain more than 3 books as a sum of simpler random variables.]

Answer:

3. (0 points) On the scale of 0–5, what is your estimate of your grade on this quiz?