

Quiz #2

Question 1:

The CDF of a discrete random variable X is given below.

$$F(x) = \begin{cases} 0, & \text{for } x < 0, \\ \frac{1}{16}, & \text{for } 0 \leq x < 1, \\ \frac{5}{16}, & \text{for } 1 \leq x < 2, \\ \frac{11}{16}, & \text{for } 2 \leq x < 3, \\ \frac{15}{16}, & \text{for } 3 \leq x < 4, \\ 1 & \text{for } x \geq 4. \end{cases}$$

- (a) Find and sketch the PMF of the random variable.
- (b) Evaluate the probability $P[X \geq 1 | X \leq 4]$

Question 2:

When shipping diesel engines abroad, it is common to pack 12 engines in one container that is then loaded on a rail car and sent to a port. Suppose that a company has received complaints from its customers that many of the engines arrive in nonworking condition. To help solve this problem, the company decides to make a spot check of containers after loading. The company will test 3 engines from the container at random; if any of the 3 are nonworking, the container will not be shipped until each engine in it is checked. Suppose that a given container has 2 nonworking engines. Find the probability that container will not be shipped.