1. Let X be a discrete random variable with the following PMF

$$P_x(x) = \begin{cases} 0.3, & x = 3 \\ 0.2, & x = 5 \\ 0.3, & x = 8 \\ 0.2, & x = 10 \\ 0, & \text{otherwise} \end{cases}$$

Find the CDF of X

2. A random variable Y has the CDF:

$$F(y) = \begin{cases} 0 & \text{for } y < 1 \\ \dfrac{y^2 - 2y + 2}{2} & \text{for } 1 \leq y < 2 \\ 1, & \text{for } y \geq 2 \end{cases}$$

Calculate the variance of Y

3. A flight from London to Accra had stopover at Amsterdam and France. In this process the luggage had been transferred three times. The probability of the 1st transfer being delayed is $\frac{6}{10}$. The probability that the second transfer was delayed, due to delay in the first transfer is $\frac{2}{10}$. The delay in the third transfer, due to delay in the first and second transfer, has a probability of $\frac{1}{10}$. What is the probability that there is delay in all the three transfers?

4. Let A and B be two independent random variables. Suppose that we know $Var(2A - B) = 6$ and $Var(2A + B) = 9$. Find

a) $Var(A)$ and $Var(B)$

b) $Var(2A + 3B)$

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