Name: _____ BU ID: _____

Problem 1

Let X have the probability mass function

$$P_X(x) = \begin{cases} 1/4, & x = -2; \\ 1/8, & x = 0; \\ 1/2, & x = 2; \\ 1/8, & x = 4; \\ 0, & \text{otherwise.} \end{cases}$$

Calculate $\mathbb{E}[X]$ and $\mathsf{Var}[X]$.

Solution:

$$\mathbb{E}[X] = (1/4)(-2) + (1/8)(0) + (1/2)(2) + (1/8)(4) = 1$$
$$\mathsf{Var}[X] = (1/4)(-2-1)^2 + (1/8)(0-1)^2 + (1/2)(2-1)^2 + (1/8)(4-1)^2 = 4$$

Problem 2

You play a game in which the amount you win X is determined by the flip of a coin and six sided die. If the coin flip is heads, you roll the die twice and win the sum of the rolls. If the coin flip is tails, you win nothing. Answer the following questions about the random variable X:

What is the value of $P_X(0)$?

What is the value of $F_X(11)$?

Solution:

 $P_X(0) = 0.5$ $F_X(11) = 1 - 1/72 = 71/72$