Circle True or False or leave blank. (1 point for correct answer, -1 for incorrect answer, 0 if left blank)

1. True   False   The PMF function f goes from subsets of $\mathbb{R}$ to $[0, 1]$.

2. True   False   If x is not in the range of X and f is the PMF of X, then $f(x) = 0$.

Show your work and justify your answers. Please circle or box your final answer.

3. (10 points) (a) (6 points) I am playing a game where I roll a die over and over until I either roll a 6, or roll the die 3 times. Let X be the random variable for how many times I need to roll the die. Compute and draw the PMF of X. (Hint: Can you roll the die 4 times? Calculate the range of X first)

    (b) (2 points) Let Y be the random variable that is 1 if the first die roll is a 6 and 0 otherwise. What is the PMF of Y?

    (c) (2 points) Are X and Y independent random variables?