

Math 10B with Professor Stankova

Quiz 6; Tuesday, 3/5/2019

Section #203; Time: 11 AM

GSI name: Roy Zhao

Name: \_\_\_\_\_

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

1. True    False    To show that  $X, Y$  are not independent random variables, we need to show that  $P(X = x, Y = y) \neq P(X = x)P(Y = y)$  for all choices of  $x, y$ .
2. True    False    If  $x$  is not in the range of  $X$  and  $f$  is the PMF of  $X$ , then  $f(x)$  does not exist.

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 flip a coin over and over until I either flip a tails, or flip the coin 4 times. Let  $X$  be the random variable for how many times I need to flip the coin. Compute and draw the PMF of  $X$ . (Hint: Can you flip the coin 5 times? Calculate the range of  $X$  first)

- (b) (2 points) Let  $Y$  be the random variable that is 1 if the first flip is a tails and 0 otherwise. What is the PMF of  $Y$ ?

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