

Math 10B with Professor Stankova

Quiz 2; Tuesday, 2/5/2019

Section #203; Time: 11 AM

GSI name: Roy Zhao

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

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

1. True    False    To count the number of bitstrings with 4 0's and 4 1's we do  $P(8, 4)P(4, 4)$  because the order of the 0 and 1 matters.
2. True    False    When we are dealing with multiple pigeons and boxes, we can use pigeonhole principle to prove that every box must have at least one pigeon in it.

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

3. (10 points) For this problem, we want to line up 3 males and 10 females in a line.
  - (a) (4 points) Prove that there must be at least 3 females that line up next to each other.

- (b) (2 points) Is it possible to line them up so that more than 3 females line up next to each other? If so, how?

- (c) (4 points) How many ways are there to line them up if we only care about the order of males and females (the males/females are indistinguishable).