Math 10B with Professor Stankova
Quiz 2; Tuesday, 1/30/2018
Section #203; Time: 9:30 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 There is only one way to prove a combinatorial identity such as $\binom{n}{k} + \binom{n}{k+1} = \binom{n+1}{k+1}$.

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 5 males and 7 females in a line.

   (a) (4 points) Prove that there must be at least 2 females that line up next to each other.

   (b) (2 points) Is it possible to line them up so that more than 2 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).