

Math 10B with Professor Stankova

Quiz 3; Tuesday, 2/12/2019

Section #203; Time: 11 AM

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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    The formula for the number of ways to place  $b$  indistinguishable balls into  $u$  distinguishable urns injectively if  $b > u$  is 0 not  $\binom{u}{b}$ .
2. True    False    It is impossible to devise an algorithm to solve the stable marriage problem if men can marry other men (the “roommate problem”).

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

3. (10 points) (a) (4 points) How many ways can I buy 200 bubble teas from RareTea for an event if there are 10 different options to choose from?

- (b) (4 points) The most popular option is original milk tea. How many ways can I do this if I need at least 20 of that option and at least 10 of every other option?

- (c) (2 points) Suppose men and women have the preferences  $m_1 : w_1 > w_3 > w_2, m_2 : w_2 > w_1 > w_3, m_3 : w_3 > w_2 > w_1$  and  $w_1 : m_1 > m_2 > m_3, w_2 : m_2 > m_3 > m_1, w_3 : m_3 > m_2 > m_1$ . Is the matching  $(m_1, w_1), (m_2, w_3), (m_3, w_2)$  stable?