Math 10B with Professor Stankova
Quiz 1; Tuesday, 1/23/2018
Section #211; 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** There is only one way to solve any counting problem.
2. True **FALSE** Whenever the problem says "at least", then we have to use complementary counting.

Solution: If the problem says, how many ways can we flip 100 coins and get at least 100 heads, then it is clear that we should do this via complementary counting.

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

3. (10 points) (a) (3 points) How many different license plates are there if a license plates consists of 3 letters followed by 3 or 4 numbers (e.g. AAA111 or AAA1111).

Solution: $26^3 \cdot 10^3 + 26^3 \cdot 10^4$.

(b) (4 points) How many numbers less than or equal to 300 are divisible by 5 or 6?

Solution: There are $300/5 = 60$ numbers divisible by 5, there are $300/6 = 50$ numbers divisible by 6, and $300/30 = 10$ numbers divisible by both. So, there are a total of $60 + 50 - 10 = 100$ numbers divisible by either.

(c) (3 points) How many ways are there to roll 6 6-sided die and roll a 6 at least once?

Solution: The complementary case is rolling and getting less than 1 6, which can only occur by getting 0 6's. This can happen in 5^6 way. Thus, there are $6^6 - 5^6$ different ways.