MATH 10B with Prof. Stankova | Student:
Section #209 ; time: 3:30-5pm | SID:
GSI: Ninh DO | Tue 3/12/19

Quiz 7 Solution

True/False - No explanation needed. (1pt for correct, 0pt - no answer, -1pt - incorrect)

1. $P(\bar{B}|A) = 1 - P(\bar{B}|\bar{A})$, where "bar" notation is the complement of the event, i.e. $\bar{A} = A^c$. True/False
   False. We have $P(\bar{B}|A) = 1 - P(B|A)$ but not the other.

2. Roll two dies. Let X be the maximum of two dies, Y be the minimum of two dies. X and Y are independent. True/False
   False. Look at prob 2 ws 14.

Problems - Need justification. No justification means **zero**!

1. (10pts) Flip a biased coin 1000 times. P(H) = 0.3 for each flip. Let X be the number of heads.
   a) Identify the name of distribution of X.
   b) Identify the range of X.
   c) Write the formula for PMF of X.
   d) Approximate PMF of X with a Poisson, i.e. write down the Poisson PMF for this process.

   a) Binomial
   b) $\{0, 1, 2, ..., 999, 1000\}$
   c) $P(X = k) = C(n, k)0.3^k * 0.7^{1000-k}$
   d) $\lambda = np = 1000 * 0.3 = 300$ not too small so the Poisson is not a good approximation but we can write:

$$P(X = k) = 300^k \frac{e^{-300}}{k!}$$