MTH 421
Quiz 1
Fall 2017

Show all work in a neat and organized fashion. Clearly indicate your answers.
20 points possible.

No CAS (e.g., no TI-89, no TI-Nspire).

1. (5 pts.) Given that $P(A \cup B) = 0.82$ and $P(A \cup B') = 0.76$, find $P(A)$.

2. (5 pts.) Someone found a bicycle lock for which the combination was unknown. The correct combination is a three-digit number, $d_1 d_2 d_3$, where d_i, $i = 1, 2, 3$, is selected from 1, 2, 3, 4, 5, and 6. How many different lock combinations are possible with such a lock?

3. (5 pts.) Let A and B be independent events with $P(A) = 0.45$ and $P(B) = 0.8$. Compute the following.

(a) $P(A \cap B)$

(b) $P(A' \cup B)$

4. (5 pts.) An actuary is studying the prevalence of three health risk factors, denoted by A, B, and C, within a population of women. For each of the three factors, the probability is 0.08 that a woman in the population has only this risk factor (and no others). For any two of the three factors, the probability is 0.2 that she has exactly these two risk factors (but not the other). The probability that a woman has all three risk factors, given that she has A and B, is $\frac{1}{5}$.

What is the probability that a woman has none of the three risk factors, given that she does not have risk factor A?