

Quiz 2

Instructions: This quiz is worth a total of 20 points with the point value of each question is listed with each question. You may use any notes or books but you must work individually. Make sure to write clearly and justify your answers.

- (1.)(6 pts.) Three marksmen shoot at a target with respective accuracies $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{5}$.
- (a.) What is the probability that exactly one of the marksmen hit the target?
 - (b.) What is the probability that at least one of the marksmen hit the target?
 - (c.) What is the probability that the third marksman missed the target, given that exactly two have hit the target?
- (2.)(4 pts.) Suppose that 3 cards are dealt in order from a shuffled deck of 52 playing cards.
- (a.) What is the probability that the third card is a club given that the first two cards are black?
 - (b.) If the second card is a diamond, what is the probability that the first card is black?
- (3.)(6 pts.) Suppose that cards are dealt from a shuffled deck of 52 playing cards until a face card appears.
- (a.) What is the probability that exactly 4 cards are required?
 - (b.) What is the probability that exactly 4 cards are needed given that more than 2 cards are required
- (4.)(4 pts.) Suppose there is a test which determines if a person has a certain gene. The test has an 80% chance of showing positive if a given person has the gene and a 10% chance of showing positive if a given person does not have the gene. It is known that 5% of the population has the gene.
- (a.) What is the probability that a given person tests positive?
 - (b.) What is the probability that a person actually has the gene if they test positive?