

Math 262

Section 1.5

Day 6

- A sequence of n independent trials are to be performed. Each trial results in a success with probability p and a failure with probability $1 - p$. What is the probability that...
 - ...all trials result in successes?
 - ...at least one trial results in a success?
 - ...exactly k trials result in successes?
- Consider an urn containing four balls, labeled 110, 101, 011, and 000. One ball is drawn at random. For $k = 1, 2, 3$, let A_k be the event that the k^{th} digit is a 1 on the ball that is drawn.
 - Are the events A_1 , A_2 , and A_3 pairwise independent? Why or why not?
 - Are the events A_1 , A_2 , and A_3 mutually independent? Why or why not?
- If A and B are independent events each with positive probability, show that they cannot be mutually exclusive.
- Create an example of three events A, B, C such that $P(A \cap B \cap C) = P(A)P(B)P(C)$ but the events are not mutually independent. (One way to do this is to draw a Venn diagram, specifying probabilities of A, B, C and their intersections.)