

Quiz 3

Student's Full Name and Number:

Question 1: A factory is expecting to receive new machinery. The manager is certain that the machinery will arrive in at most 7 days, but he does not know on which day it will arrive. Let A be the event that "It will be more than 4 days before the machinery arrives" and B be the event that "It will be less than 6 days before the machinery arrives".

- a) Describe the sample space.
- b) Describe the event \bar{A} .
- c) Describe the event $(A \cap B)$.
- d) Describe the event $A \cup B$.
- e) Are events A and B mutually exclusive? Explain.
- f) Are events A and B collectively exhaustive? Explain.
- g) $(A \cap B) \cup (\bar{A} \cap B) = ?$
- h) Show that $A \cup (\bar{A} \cap B) = A \cup B$.

Question 2: (The classical approach to probability)

a) The sample space contains 5 A's and 7 B's. What is the probability that a randomly selected set of 2 letters will include 1 A and 1 B?

b) The sample space contains 10 A's and 6 B's. What is the probability that a randomly selected set of 4 letters will include 3 A's and 1 B?

Question 3: (The relative frequency approach) In a city of 1,800,000 people, there are 30,000 legal immigrants. What is the probability that a randomly selected person from the city will be a legal immigrant?