

IB Mathematics HL 13 Probability Assignment

Due Wednesday, November 9, 2016

- 1. Events *A* and *B* are such that P(A) = 0.2 and P(B) = 0.5.
 - (a) Determine the value of $P(A \cup B)$ when
 - i. *A* and *B* are mutually exclusive;
 - ii. A and B and independent. [4 marks]
 (b) Find the smallest and largest possible values of P(A|B). [3 marks]
- 2. A set of positive integers {1, 2, 3, 4, 5, 6, 7, 8, 9} is used to form a pack of nine cards. Each card displays one positive integer without repetition from this set. Grace wishes to select four cards at random from this pack of nine cards.
 - (a) Find the number of selections Grace could make if the [3 marks] largest integer drawn among the four cards is either a 5, a 6 or a 7.
 - (b) Find the number of selections Grace could make if at [4 marks] least two of the four integers drawn are even.
- 3. Only two international airlines fly daily into an [6 marks] airport.

UN Air has 70 flights a day and IM Air has 65 flights a day. Passengers flying with UN Air have an 18 % probability of losing their luggage and passengers flying with IM Air have a 23 % probability of losing their luggage. You overhear someone in the airport complain about her luggage being lost.

Find the probability that she travelled with IM Air.

- 4. On a particular day, the probability that it rains is $\frac{2}{5}$. The probability that the *Tigers* soccer team wins on a day when it rains is $\frac{2}{7}$ and the probability that they win on a day when it does not rain is $\frac{4}{7}$.
 - (a) Draw a tree diagram to represent these events and their [1 mark] outcomes.
 - (b) What is the probability that the *Tigers* soccer team [2 marks] wins?
 - (c) Given that the *Tigers* soccer team won, what is the [2 marks] probability that it rained on that day?