

Probability

Question Paper 4

Level	International A Level
Subject	Maths
Exam Board	CIE
Topic	Probability
Sub Topic	
Booklet	Question Paper 4

Time Allowed: 60 minutes

Score: / 50

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	'77.5%	70%	62.5%	57.5%	45%	<45%

- 1** There are three sets of traffic lights on Karinne’s journey to work. The independent probabilities that Karinne has to stop at the first, second and third set of lights are 0.4, 0.8 and 0.3 respectively.
- (i)** Draw a tree diagram to show this information. [2]
 - (ii)** Find the probability that Karinne has to stop at each of the first two sets of lights but does not have to stop at the third set. [2]
 - (iii)** Find the probability that Karinne has to stop at exactly two of the three sets of lights. [3]
 - (iv)** Find the probability that Karinne has to stop at the first set of lights, given that she has to stop at exactly two sets of lights. [3]
- 2** On any occasion when a particular gymnast performs a certain routine, the probability that she will perform it correctly is 0.65, independently of all other occasions.
- (i)** Find the probability that she will perform the routine correctly on exactly 5 occasions out of 7. [2]
 - (ii)** On one day she performs the routine 50 times. Use a suitable approximation to estimate the probability that she will perform the routine correctly on fewer than 29 occasions. [5]
 - (iii)** On another day she performs the routine n times. Find the smallest value of n for which the expected number of correct performances is at least 8. [2]
- 3** Two fair dice are thrown.
- (i)** Event A is ‘the scores differ by 3 or more’. Find the probability of event A . [3]
 - (ii)** Event B is ‘the product of the scores is greater than 8’. Find the probability of event B . [2]
 - (iii)** State with a reason whether events A and B are mutually exclusive. [2]

- 4 Boxes of sweets contain toffees and chocolates. Box A contains 6 toffees and 4 chocolates, box B contains 5 toffees and 3 chocolates, and box C contains 3 toffees and 7 chocolates. One of the boxes is chosen at random and two sweets are taken out, one after the other, and eaten.
- (i) Find the probability that they are both toffees. [3]
- (ii) Given that they are both toffees, find the probability that they both came from box A . [3]
- 5 When Andrea needs a taxi, she rings one of three taxi companies, A , B or C . 50% of her calls are to taxi company A , 30% to B and 20% to C . A taxi from company A arrives late 4% of the time, a taxi from company B arrives late 6% of the time and a taxi from company C arrives late 17% of the time.
- (i) Find the probability that, when Andrea rings for a taxi, it arrives late. [3]
- (ii) Given that Andrea's taxi arrives late, find the conditional probability that she rang company B . [3]
- 6 In a certain country 54% of the population is male. It is known that 5% of the males are colour-blind and 2% of the females are colour-blind. A person is chosen at random and found to be colour-blind. By drawing a tree diagram, or otherwise, find the probability that this person is male. [6]
- 7 Ivan throws three fair dice.
- (i) List all the possible scores on the three dice which give a total score of 5, and hence show that the probability of Ivan obtaining a total score of 5 is $\frac{1}{36}$. [3]
- (ii) Find the probability of Ivan obtaining a total score of 7. [3]