

Self-assessment: 22 Probability

1. A bag contains 12 red and 16 green tokens. Two tokens are taken out without replacement.
- (a) Given that the first token is red, write down the probability that the second token is also red.
 - (b) Find the probability that both tokens are the same colour.
 - (c) Given that the second token is red, find the probability that both tokens are the same colour.

(accessible to students on the path to grade 3 or 4) [7 marks]

2. Out of 85 students at an IB college, 42 speak English at home, 31 speak Spanish and 18 speak Russian. Some students speak all three of these languages at home, but no one speaks exactly two. All students speak at least one of these languages at home.
- (a) How many students speak all three languages?
 - (b) Given that a student speaks Spanish at home, what is the probability that they also speak Russian?

(accessible to students on the path to grade 5 or 6) [7 marks]

3. Given that $P(A|B') = \frac{4}{5}$, $P(B) = \frac{1}{8}$ and $P(A) = \frac{4}{5}$,

- (a) Find $P(A \cap B)$.
- (b) Find $P(B|A')$.
- (c) State, with a reason, whether A and B are independent events.

(accessible to students on the path to grade 5 or 6) [9 marks]

4. Tamara can drive to school, cycle or take the bus, each with equal probability. If she drives, the probability that she is late is 0.15, if she cycles it is 0.08 and if she takes the bus it is 0.12. Given that she is late for school today, what is the probability that she took the bus?

(accessible to students on the path to grade 5 or 6) [7 marks]