Exercise 3F

1 My wardrobe contains five shirts with one blue, one brown, one red, one white and one black. I reach into the wardrobe and choose a shirt without looking. I replace this shirt and then choose another. What is the probability that I will choose the red shirt both times?

2 A card is chosen at random from a deck of 52 cards. It is then replaced and a second card is chosen. What is the probability of choosing a king and a ten?

3 A large school conducts a survey of the food provided by the school cafeteria. It is found that $\frac{4}{5}$ of the students like pasta.

Three students are chosen at random. What is the probability that all three students like pasta?

EXAM-STYLE QUESTIONS

4 Adam is playing in a cricket match and a game of hockey at the weekend.
The probability that his team will win the cricket match is 0.75, and the probability of winning the hockey match is 0.85.
Assume that the results in the matches are independent. What is the probability that his team will win in both matches?

5 Three events A, B and C are such that A and B are mutually exclusive and $P(A) = 0.2$, $P(C) = 0.3$, $P(A \cup B) = 0.4$ and $P(B \cup C) = 0.34$.
a Calculate $P(B)$ and $P(B \cap C)$.
b Determine whether B and C are independent.

6 I toss a coin and roll a six-sided dice. Find the probability that I get a head on the coin, and don't get a 6 on the dice.

7 An air-to-air missile has probability $\frac{8}{9}$ of hitting a target. If five missiles are launched, what is the probability that the target is not destroyed?

8 Four cards are chosen from a standard deck of 52 playing cards with replacement. What is the probability of choosing 4 hearts in a row?

EXAM-STYLE QUESTION

9 Given that $P(E') = P(F) = 0.6$ and $P(E \cap F) = 0.24$
   a write down $P(E)$,
   b explain why E and F are independent,
   c explain why E and F are not mutually exclusive,
   d find $P(E \cup F')$.

10 Three bags each contain 4 red and 8 blue marbles. One marble is randomly chosen from each bag.

   What is the probability that the first marble will be red, the second marble blue and the third marble red?

11 A six-sided dice is numbered: 1, 2, 2, 5, 6, 6. It is thrown three times. What is the probability that the scores add up to 6?

EXAM-STYLE QUESTION

12 A and B are independent events such that $P(A) = 0.9$ and $P(B) = 0.3$. Find:
   a $P(A \cap B)$ **b** $P(A \cap B')$ **c** $P(A \cup B)'$.