



4.19F Probability: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** A spinner has four equal sections coloured red, blue, green and yellow. What is the probability that one spin lands on green?

(Total for Question 1 is 1 mark)

- 2** A fair six-sided die is rolled once. What is the probability of rolling an odd number?

(Total for Question 2 is 1 mark)

- 3** A bag contains 5 red counters and 3 blue counters. A counter is taken at random. Work out the probability the counter is blue.

(Total for Question 3 is 2 marks)

- 4** A bag contains 2 white, 4 black and 4 green counters. A counter is chosen at random. Work out the probability the counter is not black.

(Total for Question 4 is 2 marks)

5 A coin is flipped twice. List all possible outcomes using H for heads and T for tails, and then write down the probability of getting exactly one head.

(a) List all possible outcomes. (1)

(b) Work out the probability of exactly one head. (2)

(Total for Question 5 is 3 marks)

6 A jar contains 3 strawberry sweets, 2 mint sweets and 5 lemon sweets. One sweet is taken at random. Work out the probability the sweet is strawberry or lemon.

(Total for Question 6 is 4 marks)

7 A bag contains counters labelled 1, 2, 3 and 4. A counter is chosen at random and then replaced. Two independent draws are made. Work out the probability that the first draw is 3 and the second draw is less than 3.

(Total for Question 7 is 4 marks)

8 A fair spinner has three equal regions labelled A, B and C. Jamie spins the spinner twice. Work out the probability Jamie gets A both times.

(a) Work out the probability of getting A on one spin. (1)

(b) Work out the probability Jamie gets A on both spins. Show your method. (4)

(Total for Question 8 is 5 marks)

9 Two coins are different: one is a 1 pence coin and one is a 2 pence coin. Both are fair. They are flipped once. Find the probability that the total value of coins that land heads is 3 pence.

(Total for Question 9 is 3 marks)

10 A bag contains 6 red counters and 4 blue counters. Two counters are drawn at random without replacement. Work out the probability that both counters are red.

(Total for Question 10 is 5 marks)

- 11** A spinner is divided into three unequal regions. The probabilities of landing on X, Y and Z are $\frac{1}{6}$, $\frac{1}{3}$ and $\frac{1}{2}$ respectively. The spinner is spun twice. Work out the probability that at least one spin lands on Z.

(Total for Question 11 is 5 marks)

- 12** A bag contains 4 green, 3 purple and 3 orange counters. Two counters are drawn at random without replacement. Work out the probability that the two counters are different colours.

(Total for Question 12 is 5 marks)

Mark scheme · 4.19F Probability: Foundation Tier Practice

Question 1

- **B1** $\frac{1}{4}$ cao
- **Answer:** $\frac{1}{4}$ (or 0.25 or 25%)

Question 2

- **B1** $\frac{3}{6}$ or $\frac{1}{2}$ cao
- **Answer:** $\frac{1}{2}$ (or 0.5 or 50%)

Question 3

- **M1** correct fraction method $\frac{3}{(5+3)}$ oe
- **A1** $\frac{3}{8}$ cao
- **Answer:** $\frac{3}{8}$

Question 4

- **M1** $1 - P(\text{black})$ or $(2+4)/10$ shown oe
- **A1** $\frac{6}{10} = \frac{3}{5}$ cao
- **Answer:** $\frac{3}{5}$

Question 5

- (a) **B1** list: HH, HT, TH, TT (in any order) oe
- (a) **Answer:** HH, HT, TH, TT
- (b) **M1** 2 favourable outcomes (HT, TH) shown out of 4
- (b) **A1** $\frac{1}{2}$ cao
- (b) **Answer:** $\frac{1}{2}$

Question 6

- **M1** identify favourable outcomes 3+5 and total $3+2+5 = 10$
- **M1** state the fraction $\frac{8}{10}$ oe
- **M1** show method to simplify $\frac{8}{10}$ to $\frac{4}{5}$
- **A1** $\frac{4}{5}$ cao
- **Answer:** $\frac{4}{5}$

Question 7

- **M1** $P(\text{first} = 3) = \frac{1}{4}$ identified
- **M1** $P(\text{second} < 3) = \frac{2}{4}$ identified
- **M1** multiply probabilities for independent events: $(\frac{1}{4}) \times (\frac{2}{4}) = \frac{2}{16}$ shown
- **A1** $\frac{1}{8}$ cao
- **Answer:** $\frac{1}{8}$

Question 8

- (a) **B1** $\frac{1}{3}$ cao
- (a) **Answer:** $\frac{1}{3}$
- (b) **M1** state independence and multiply: $(\frac{1}{3}) \times (\frac{1}{3})$ oe
- (b) **M1** multiply to give $\frac{1}{9}$
- (b) **M1** show product as fraction $\frac{1}{9}$ oe
- (b) **A1** $\frac{1}{9}$ cao
- (b) **Answer:** $\frac{1}{9}$

Question 9

- **M1** list of all four equally likely outcomes for heads/tails on the two coins, e.g. (1p H, 2p H), (1p H, 2p T), (1p T, 2p H), (1p T, 2p T) or equivalent
- **M1** identify favourable outcome(s): both coins heads gives total 3p
- **A1** $\frac{1}{4}$ cao
- **Answer: $\frac{1}{4}$**

Question 10

- **M1** $P(\text{first red}) = \frac{6}{10}$ stated
- **M1** $P(\text{second red after first red}) = \frac{5}{9}$ stated
- **M1** multiply probabilities: $(\frac{6}{10}) \times (\frac{5}{9})$ shown
- **M1** simplify product $\frac{30}{90}$ shown
- **A1** $\frac{1}{3}$ cao
- **Answer: $\frac{1}{3}$**

Question 11

- **M1** identify $P(Z) = \frac{1}{2}$
- **M1** calculate $P(\text{no Z in one spin}) = 1 - \frac{1}{2} = \frac{1}{2}$ or state directly $\frac{1}{2}$
- **M1** compute $P(\text{no Z in two spins}) = (\frac{1}{2}) \times (\frac{1}{2}) = \frac{1}{4}$
- **M1** use complement: $1 - \frac{1}{4}$ shown
- **A1** $\frac{3}{4}$ cao
- **Answer: $\frac{3}{4}$**

Question 12

- **M1** calculate total outcomes denominator 10×9 , or work with probabilities sequentially
- **M1** calculate probability both same colour: $P(\text{both green}) = (\frac{4}{10}) \times (\frac{3}{9})$ and $P(\text{both purple}) = (\frac{3}{10}) \times (\frac{2}{9})$ and $P(\text{both orange}) = (\frac{3}{10}) \times (\frac{2}{9})$ or equivalent
- **M1** sum same-colour probabilities: $(\frac{4}{10}) \times (\frac{3}{9}) + (\frac{3}{10}) \times (\frac{2}{9}) + (\frac{3}{10}) \times (\frac{2}{9}) = (\frac{12}{90} + \frac{6}{90} + \frac{6}{90}) = \frac{24}{90}$ shown
- **M1** use complement: $1 - \frac{24}{90} = \frac{66}{90}$ shown
- **A1** simplify to $\frac{11}{15}$ cao
- **Answer: $\frac{11}{15}$**