

Probability

ANSWERS

Calculator | 30 minutes | Total marks: 28

Name Class

1

A bag contains 3 red counters, 5 blue counters and 2 green counters. One counter is taken at random.

(a) Write the probability of blue as a fraction, a decimal and a percentage.

fraction $\frac{5}{10}$ or $\frac{1}{2}$

decimal 0.5 (1)

percentage 50% (1) [2 marks]

(b) Write down the probability that the counter is not red.

Answer $\frac{7}{10}$ (1) [1 mark]

2

A fair coin is thrown three times.

(a) List all the possible outcomes. Two have been done for you.

HHH HHT

HTH, HTT, THH, THT, TTH, TTT (1)(1)

[2 marks]

(b) Write down the probability of getting exactly two heads.

Answer $\frac{3}{8}$ (1) [1 mark]

3

Two fair spinners each have the numbers 1, 2, 3 and 4. Each is spun once and the two numbers are multiplied.

(a) Complete the sample space diagram.

×	1	2	3	4
1	1	2	3	4
2	2	4	6	8
3	3	6	9	12
4	4	8	12	16 (1)(1)

[2 marks]

(b) Write down the probability that the product is more than 8

Answer $\frac{4}{16}$ (1)

[1 mark]

(c) Write down the probability that the product is even.

Answer $\frac{12}{16}$ (1)

[1 mark]

4

A fair dice is rolled 150 times.

Work out how many sixes you would expect.

$150 \div 6$ (1)

Answer 25 (1)

[2 marks]

5

A spinner has three equal sections coloured red, blue and green. It is spun 60 times.

Colour	red	blue	green
Frequency	18	27	15

- (a) Write down the relative frequency of blue.

Answer $\frac{27}{60}$ or 0.45 (1)

[1 mark]

- (b) Do the results suggest the spinner is fair?

Give a reason for your answer.

A fair spinner should give about 20 of each colour (1)

Blue is much higher, so it may be biased (1)

[2 marks]

- (c) The spinner is spun 400 times.

Use the results to estimate the number of times it lands on blue.

0.45×400 (1)

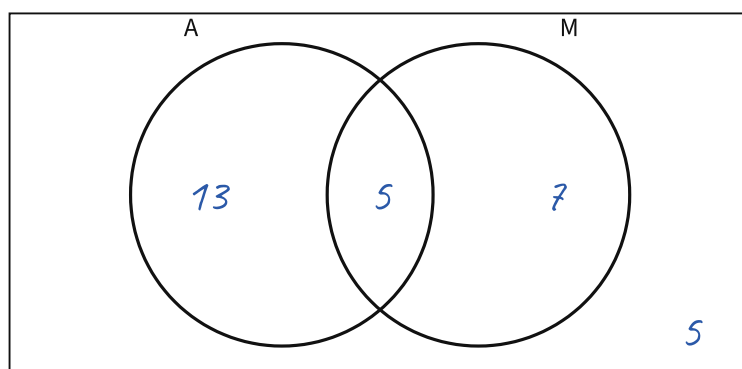
Answer 180 (1)

[2 marks]

6

There are 30 students in a class. 18 study art (A), 12 study music (M) and 5 study both.

- (a) Complete the Venn diagram.



5 in the middle (1)

13, 7 and 5 outside (1)

[2 marks]

- (b) A student is chosen at random. Write down

$P(A \cap M) = \frac{5}{30}$ (1)

[1 mark]

$P(A \cup M) = \frac{25}{30}$ (1)

[1 mark]

$P(A') = \frac{12}{30}$ (1)

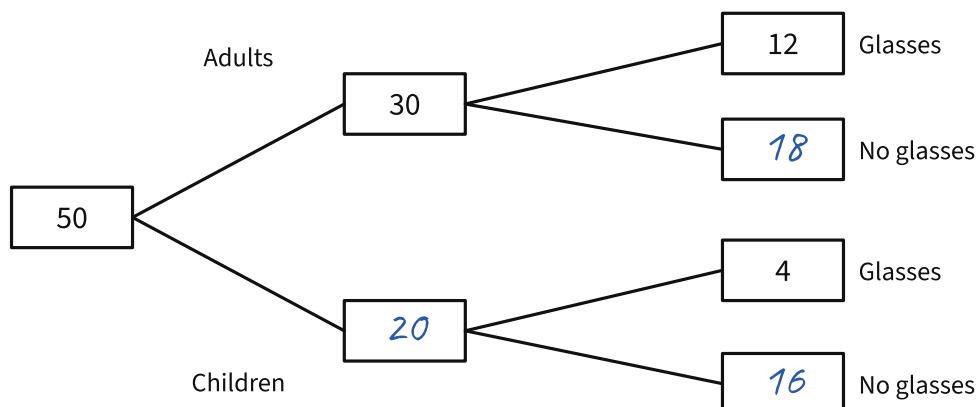
[1 mark]

7

There are 50 people at a party. 30 are adults.

12 adults wear glasses and 4 children wear glasses.

(a) Complete the frequency tree.



All three correct (1)(1). One mark for two correct

[2 marks]

(b) A person is chosen at random.

Write down the probability that the person wears glasses.

Answer $\frac{16}{50}$ (1)

[1 mark]

8

- (a) A dice is rolled once. Event A is rolling an even number. Event B is rolling a 3. Explain why A and B are mutually exclusive.

They cannot both happen, 3 is not even (1)

[1 mark]

- (b) A fair coin is thrown and a fair dice is rolled. The two events are independent. Work out the probability of a head and a six.

$$\frac{1}{2} \times \frac{1}{6} \text{ (1)}$$

Answer $\frac{1}{12}$ (1)

[2 marks]

Question	Topic	RAG
1	I can write probabilities as fractions, decimals and percentages	
2	I can list outcomes for three events	
3	I can use a sample space diagram	
4	I can work out an expected number	
5	I can use relative frequency and judge bias	
6	I can use a Venn diagram with set notation	
7	I can use a frequency tree	
8	I understand mutually exclusive and independent events	