5.1 Probability: 30-minute Pack

Calculator allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A fair coin is tossed and a fair 5-sided spinner numbered 1 to 5 is spun. Find P(coin shows Heads and spinner shows an odd number). Give your answer as a fraction.

(2)

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2 A bag contains 7 red and 5 blue counters. Two counters are drawn at random, one after another, without replacement. Find the probability that the first counter is red and the second counter is blue. Give your answer as a fraction in simplest form.

(3)

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3 A bag has 15 counters, of which 9 are green. Write the probability of picking a green counter as a percentage.

(1)

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4 60 students were asked to name their favourite subject. 21 chose Maths, 15 chose Art, and the rest chose Science. Estimate the probability that a randomly selected student chose Science. Give your answer as a fraction in simplest form.

(2)

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5 A fair six-sided dice, numbered 1 to 6, is rolled once.

(a) Write down P(rolling a 3). **(1)**

(b) Find P(rolling an even number). **(1)**

(c) Find P(rolling a number greater than 4). **(1)**

(d) Find P(rolling a number less than 10). **(1)**

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6 One letter is chosen at random from the word STATISTICS. Work out the probability that it is the letter C.

(2)

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7 A fair 12-sided spinner numbered 1 to 12 is rolled. Work out the probability of getting a multiple of 3. Give your answer as a fraction in its simplest form.

(2)

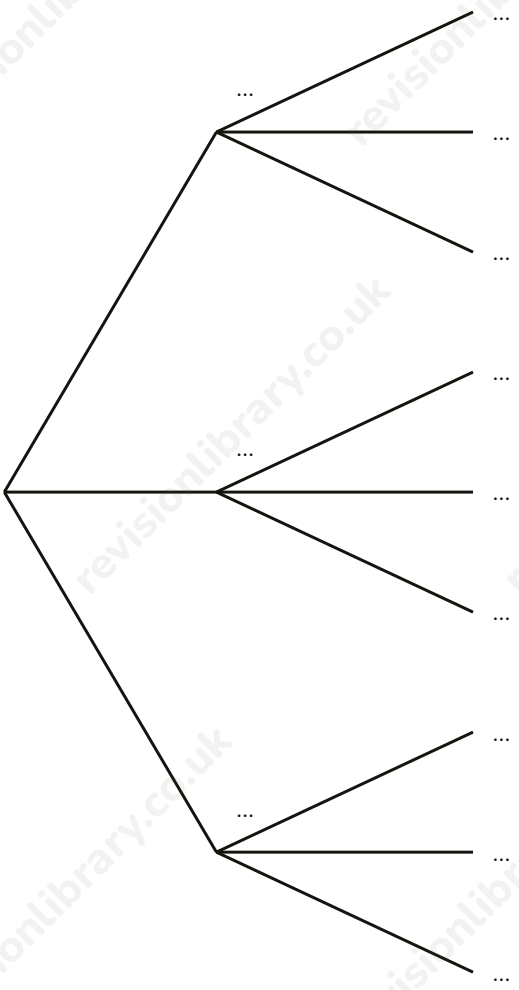
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8 A bag contains 2 green, 6 black, 5 yellow, 2 orange marbles. One is taken at random. Write down the probability that it is yellow. Give your answer as a fraction in its simplest form.

(2)

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9 A fair spinner has three equal sections coloured red, blue and green. It is spun twice.



(a) Draw a fully labelled tree diagram to show the possible outcomes and probabilities for the two spins. **(2)**

(b) Find P(both spins land on the same colour). **(2)**

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(c) Find P(at least one of the two spins lands on red). **(2)**

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Mark scheme · 5.1 Probability: 30-minute Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

identify P(Heads) = 1/2 and P(odd) = 3/5	**M1**
3/10 cao	**A1**

Answer: **3/10**

Question 2

identify the first probability 7/12	**M1**
identify the second probability 5/11 (after one red removed) and multiply	**M1**
35/132 cao	**A1**

Answer: **35/132**

Question 3

60% cao	**B1**

Answer: **60%**

Question 4

find number choosing Science, 60 - 21 - 15 = 24	**M1**
2/5 cao oe (e.g. 24/60)	**A1**

Answer: **2/5**

Question 5

(a) 1/6 cao oe	**B1**

(a) Answer: **1/6**

(b) 1/2 cao oe (e.g. 3/6)	**B1**

(b) Answer: **1/2**

(c) 1/3 cao oe (e.g. 2/6)	**B1**

(c) Answer: **1/3**

(d) 1 cao, with reason that all outcomes are less than 10	**B1**

(d) Answer: **1**

Question 6

1 out of 10	**M1**
1/10 cao	**A1**

Answer: **1/10**

Question 7

identifies favourable outcomes 3, 6, 9, 12 or 4/12	**M1**
1/3 cao	**A1**

Answer: **1/3**

Question 8

5 out of 15 or 5/15 seen	**M1**
1/3 cao	**A1**

Answer: **1/3**

Question 9

(a) Correct branch structure for the first spin, with probability 1/3 on each of the 3 branches	**B1**
(a) Correct branch structure for the second spin repeated after each first-spin branch, with probability 1/3 on each	**B1**

(a) Answer: **Tree diagram with 1/3 on every branch at both stages, giving 9 outcomes**

(b) 3 x (1/3 x 1/3), ft from part a	**M1**
(b) 1/3 cao oe	**A1**

(b) Answer: **1/3**

(c) 1 - (2/3 x 2/3), ft from part a (correct complement method)	**M1**
(c) 5/9 cao	**A1**

(c) Answer: **5/9**

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