5.7 Mutually Exclusive Events: 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A bag contains 7 black, 8 white and 9 orange marbles. Wendy takes one at random.

(a) What is the probability that it is not black?

(b) What is the probability that it is black or white?

(c) Wendy puts the object back and repeats this 120 times. How many times would you expect a black object to be taken?

Give probabilities as fractions in their simplest form.

(Total for Question 1 is 6 marks)

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2 A bag contains 1 blue, 2 red, 7 orange and 8 green marbles. Ella takes one at random.

(a) What is the probability that it is blue?

(b) What is the probability that it is not blue?

Give probabilities as fractions in their simplest form.

(Total for Question 2 is 3 marks)

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3 A spinner has 4 colours. The probability of each colour is in the table. The colours are mutually exclusive.

Colour	Probability
black	3/20
yellow	9/100
red	7/50
green	x

(a) Work out the value of x.
(b) Work out the probability of yellow or green.
(c) The spinner is spun 400 times. Estimate the number of times it lands on green.

(Total for Question 3 is 5 marks)

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4 For each event, write the probability as a number between 0 and 1 (as a fraction or decimal) and the word that best describes it: impossible, unlikely, evens, likely or certain.
(a) rolling a number less than 7 on an ordinary dice
(b) picking a vowel from the letters of the word BRIGHT
(c) picking a prime from the whole numbers 1 to 6

(Total for Question 4 is 3 marks)

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5 A bag contains 3 red, 3 blue, 3 white and 5 black cubes. Carys takes one at random.

(a) What is the probability that it is not red?

(b) What is the probability that it is red or blue?

(c) Carys puts the object back and repeats this 140 times. How many times would you expect a red object to be taken?

Give probabilities as fractions in their simplest form.

(Total for Question 5 is 6 marks)

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6 A spinner has 5 colours. The probability of each colour is in the table. The colours are mutually exclusive.

Colour	Probability
black	1/40
blue	3/40
yellow	3/10
green	1/4
white	x

(a) Work out the value of x.

(b) Work out the probability of blue or yellow.

(c) The spinner is spun 200 times. Estimate the number of times it lands on white.

(Total for Question 6 is 5 marks)

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7 A biased spinner has outcomes C, A, E, F, B, D. The probabilities are in the table; one value is missing.

Outcome	Probability
C	1/200
A	7/200
E	1/25
F	1/50
B	1/100
D	x

(a) Work out the value of x.

(b) The spinner is spun 1000 times. Estimate how many times outcome D occurs.

(Total for Question 7 is 4 marks)

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8 A biased spinner has outcomes E, D, B, C, A. The probabilities are in the table; one value is missing.

Outcome	Probability
E	7/50
D	2/25
B	7/50
C	2/25
A	x

(a) Work out the value of x.

(b) The spinner is spun 250 times. Estimate how many times outcome A occurs.

(Total for Question 8 is 4 marks)

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9 A spinner has 5 colours. The probability of each colour is in the table. The colours are mutually exclusive.

Colour	Probability
white	6/25
red	23/100
blue	13/50
black	4/25
green	x

(a) Work out the value of x.

(b) Work out the probability of green or blue.

(c) The spinner is spun 400 times. Estimate the number of times it lands on green.

(Total for Question 9 is 5 marks)

10 A bag contains 7 red, 3 green and 3 white sweets. Aisha takes one at random.

(a) What is the probability that it is not red?

(b) What is the probability that it is red or green?

(c) Aisha puts the object back and repeats this 260 times. How many times would you expect a red object to be taken?

Give probabilities as fractions in their simplest form.

(Total for Question 10 is 6 marks)

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11 For each event, write the probability as a number between 0 and 1 (as a fraction or decimal) and the word that best describes it: impossible, unlikely, evens, likely or certain.

(a) picking a blue ball from a bag with 1 blue ball out of 20

(b) rolling a 7 on an ordinary dice

(c) picking a vowel from the letters of the word BRIGHT

(Total for Question 11 is 3 marks)

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12 A spinner has 5 colours. The probability of each colour is in the table. The colours are mutually exclusive.

Colour	Probability
red	31/100
blue	6/25
green	7/100
white	27/100
yellow	x

(a) Work out the value of x.

(b) Work out the probability of yellow or white.

(c) The spinner is spun 400 times. Estimate the number of times it lands on yellow.

(Total for Question 12 is 5 marks)

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13 A biased spinner has outcomes D, C, A, E, B. The probabilities are in the table; one value is missing.

Outcome	Probability
D	1/5
C	7/40
A	x
E	1/40
B	7/40

(a) Work out the value of x.

(b) The spinner is spun 200 times. Estimate how many times outcome A occurs.

(Total for Question 13 is 4 marks)

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Mark scheme · 5.7 Mutually Exclusive Events: 1-hour Pack

Question 1

1 - 7/24 or 17/24	M1
17/24 oe	A1
(7 + 8) / 24	M1
5/8 oe	A1
7/24 x 120	M1
35 cao	A1

Answer: (a) 17/24; (b) 5/8; (c) 35

Question 2

1/18 oe	B1
1 - 1/18 or 17/18	M1
17/18 oe	A1

Answer: (a) 1/18; (b) 17/18

Question 3

1 minus the sum of the other probabilities	M1
31/50 oe	A1
adds the two probabilities	M1
71/100 oe	A1
248 cao	B1

Answer: (a) 31/50; (b) 71/100; (c) 248

Question 4

1 and certain	B1
1/6 (awrt 0.17) and unlikely	B1
0.5 and evens	B1

Answer: (a) 1, certain; (b) 1/6, unlikely; (c) 0.5, evens

Question 5

1 - 3/14 or 11/14	M1
11/14 oe	A1
(3 + 3) / 14	M1
3/7 oe	A1
3/14 x 140	M1
30 cao	A1

Answer: (a) 11/14; (b) 3/7; (c) 30

Question 6

1 minus the sum of the other probabilities	M1
7/20 oe	A1
adds the two probabilities	M1
3/8 oe	A1
70 cao	B1

Answer: (a) 7/20; (b) 3/8; (c) 70

Question 7

1 minus the sum of the other probabilities	M1
89/100 oe	A1
89/100 x 1000	M1
890 cao	A1

Answer: (a) 89/100; (b) 890

Question 8

1 minus the sum of the other probabilities	M1
14/25 oe	A1
14/25 x 250	M1
140 cao	A1

Answer: (a) 14/25; (b) 140

Question 9

1 minus the sum of the other probabilities	M1
11/100 oe	A1
adds the two probabilities	M1
37/100 oe	A1
44 cao	B1

Answer: (a) 11/100; (b) 37/100; (c) 44

Question 10

1 - 7/13 or 6/13	M1
6/13 oe	A1
(7 + 3) / 13	M1
10/13 oe	A1
7/13 x 260	M1
140 cao	A1

Answer: (a) 6/13; (b) 10/13; (c) 140

Question 11

0.05 and unlikely	B1
0 and impossible	B1
1/6 (awrt 0.17) and unlikely	B1

Answer: (a) 0.05, unlikely; (b) 0, impossible; (c) 1/6, unlikely

Question 12

1 minus the sum of the other probabilities	M1
11/100 oe	A1
adds the two probabilities	M1
19/50 oe	A1
44 cao	B1

Answer: (a) 11/100; (b) 19/50; (c) 44

Question 13

1 minus the sum of the other probabilities	M1
17/40 oe	A1
17/40 x 200	M1
85 cao	A1

Answer: (a) 17/40; (b) 85

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