HIGHER

5.4 Conditional Probability (Higher): 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 46 people were asked about two activities: A is that they like tea; B is that they like coffee. 18 people do A only, 11 do both A and B, 14 do B only, and 3 do neither.
(a) Work out the probability that a person chosen at random is in A.
(b) Work out the probability that a person chosen at random is in both A and B.
(c) Work out the probability that a person chosen at random is in neither A nor B.
Give each answer as a fraction in its simplest form.

(Total for Question 1 is 6 marks)

2 A bag contains 6 blue and 8 green beads. Two are taken at random without replacement. Work out the probability that they are different colours. Give your answer as a fraction in its simplest form.

(Total for Question 2 is 3 marks)

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3 The two-way table shows information about 88 people.

	walk	bus	Total
adults	33	7	40
children	27	21	48
Total	60	28	88

(a) A person from the 'adults' group is chosen at random. Find the probability that they are in the group 'walk'.
(b) Is being in group 'adults' independent of being in group 'walk'? Show your working.

(Total for Question 3 is 4 marks)

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4 A bag contains 8 pink and 3 blue marbles. Two are taken at random without replacement. Work out the probability that they are different colours. Give your answer as a fraction in its simplest form.

(Total for Question 4 is 3 marks)

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5 39 people were asked about two activities: A is that they study French; B is that they study Spanish. 2 people do A only, 9 do both A and B, 19 do B only, and 9 do neither.
(a) Work out the probability that a person chosen at random is in neither A nor B.
(b) Work out the probability that a person chosen at random is in at least one of A and B.
(c) Given that a person is in A, what is the probability that they are also in B?
Give each answer as a fraction in its simplest form.

(Total for Question 5 is 6 marks)

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6 A bag contains 5 blue and 8 pink cubes. Two are taken at random without replacement. Work out the probability that the second is pink. Give your answer as a fraction in its simplest form.

(Total for Question 6 is 3 marks)

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7 36 people were asked about two activities: A is that they like tea; B is that they like coffee. 7 people do A only, 2 do both A and B, 17 do B only, and 10 do neither.
(a) Work out the probability that a person chosen at random is in A.
(b) Work out the probability that a person chosen at random is in both A and B.
(c) Work out the probability that a person chosen at random is in neither A nor B.
Give each answer as a fraction in its simplest form.

(Total for Question 7 is 6 marks)

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8 The two-way table shows information about 59 people.

	pass	fail	Total
adults	6	12	18
children	24	17	41
Total	30	29	59

(a) A person from the 'adults' group is chosen at random. Find the probability that they are in the group 'pass'.
(b) A person from the 'pass' group is chosen at random. Find the probability that they are in the group 'children'.
Give each answer as a fraction in its simplest form.

(Total for Question 8 is 4 marks)

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9 39 people were asked about two activities: A is that they play football; B is that they play tennis.
17 people do A only, 4 do both A and B, 7 do B only, and 11 do neither.
(a) Work out the probability that a person chosen at random is in A.
(b) Work out the probability that a person chosen at random is in both A and B.
(c) Work out the probability that a person chosen at random is in neither A nor B.
Give each answer as a fraction in its simplest form.

(Total for Question 9 is 6 marks)

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10 The two-way table shows information about 91 people.

	vaccinated	not vaccinated	Total
adults	20	6	26
children	35	30	65
Total	55	36	91

(a) A person from the 'adults' group is chosen at random. Find the probability that they are in the group 'vaccinated'.
(b) A person from the 'vaccinated' group is chosen at random. Find the probability that they are in the group 'children'.
Give each answer as a fraction in its simplest form.

(Total for Question 10 is 4 marks)

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11 A bag contains 3 green and 3 red sweets. Two are taken at random without replacement. Work out the probability that they are different colours. Give your answer as a fraction in its simplest form.

(Total for Question 11 is 3 marks)

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12 A bag contains 7 red and 4 pink counters. Two are taken at random without replacement. Work out the probability that the second is pink. Give your answer as a fraction in its simplest form.

(Total for Question 12 is 3 marks)

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13 A bag contains 7 yellow and 4 red sweets. One is taken at random and not replaced. Given that the first is yellow, work out the probability that the second is also yellow. Give your answer as a fraction in its simplest form.

(Total for Question 13 is 3 marks)

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14 A bag contains 5 black and 9 green cubes. One is taken at random and not replaced. Given that the first is black, work out the probability that the second is also black. Give your answer as a fraction in its simplest form.

(Total for Question 14 is 3 marks)

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Mark scheme · 5.4 Conditional Probability (Higher): 1-hour Pack

Question 1

identifies the relevant frequencies	**M1**
29/46 oe	**A1**
identifies the relevant frequencies	**M1**
11/46 oe	**A1**
identifies the relevant frequencies	**M1**
3/46 oe	**A1**

Answer: (a) 29/46; (b) 11/46; (c) 3/46

Question 2

6/14 x 8/13 for one order	**M1**
adds the two orders	**M1**
48/91 oe	**A1**

Answer: 48/91

Question 3

33/40 (denominator is the row total)	**M1**
33/40 oe	**A1**
compares P(A given B) = 33/40 with P(A) = 15/22	**M1**
not independent, since the probabilities differ	**A1**

Answer: (a) 33/40; (b) not independent

Question 4

8/11 x 3/10 for one order	**M1**
adds the two orders	**M1**
24/55 oe	**A1**

Answer: 24/55

Question 5

identifies the relevant frequencies	**M1**
3/13 oe	**A1**
identifies the relevant frequencies	**M1**
10/13 oe	**A1**
identifies the restricted group (the denominator)	**M1**
9/11 oe	**A1**

Answer: (a) 3/13; (b) 10/13; (c) 9/11

Question 6

considers both possible first colours	**M1**
multiplies and adds branch probabilities	**M1**
8/13 oe	**A1**

Answer: 8/13

Question 7

identifies the relevant frequencies	**M1**
1/4 oe	**A1**
identifies the relevant frequencies	**M1**
1/18 oe	**A1**
identifies the relevant frequencies	**M1**
5/18 oe	**A1**

Answer: (a) 1/4; (b) 1/18; (c) 5/18

Question 8

6/18 (denominator is the row total)	**M1**
1/3 oe	**A1**
24/30 (denominator is the column total)	**M1**
4/5 oe	**A1**

Answer: (a) 1/3; (b) 4/5

Question 9

identifies the relevant frequencies	**M1**
7/13 oe	**A1**
identifies the relevant frequencies	**M1**
4/39 oe	**A1**
identifies the relevant frequencies	**M1**
11/39 oe	**A1**

Answer: (a) 7/13; (b) 4/39; (c) 11/39

Question 10

20/26 (denominator is the row total)	**M1**
10/13 oe	**A1**
35/55 (denominator is the column total)	**M1**
7/11 oe	**A1**

Answer: (a) 10/13; (b) 7/11

Question 11

3/6 x 3/5 for one order	**M1**
adds the two orders	**M1**
3/5 oe	**A1**

Answer: 3/5

Question 12

considers both possible first colours	**M1**
multiplies and adds branch probabilities	**M1**
4/11 oe	**A1**

Answer: 4/11

Question 13

10 left in the bag	**M1**
6 yellow remaining	**M1**
3/5 oe	**A1**

Answer: 3/5

Question 14

13 left in the bag	**M1**
4 black remaining	**M1**
4/13 oe	**A1**

Answer: 4/13

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