3.20 Two Way Tables: 1-hour Pack

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 In a group of 36 pupils, 21 play music and 15 do not. There are 14 boys and 22 girls. Of the boys, 9 play music.

Complete the missing entry: how many girls do not play music?

(Total for Question 1 is 1 mark)

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2 Mrs Osei, the school nurse, recorded whether pupils in Class A and Class B have a peanut allergy, out of 60 pupils in total. The completed two-way table is shown below.

Peanut Allergy

	Allergy Yes	Allergy No	Total
Class A	4	26	**30**
Class B	6	24	**30**
Total	**10**	**50**	**60**

(a) Write down the number of pupils in Class B who do not have a peanut allergy. **(1)**

.....

(b) Work out the probability that a randomly selected pupil (from all 60) has a peanut allergy. **(2)**

.....

(c) One pupil is chosen at random from Class A. Find the probability that this pupil does not have a peanut allergy. **(2)**

.....

(Total for Question 2 is 5 marks)

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3 Aisha Malik surveyed a sample of 60 visitors to a museum about whether they bought a souvenir, split by Adult and Child. The completed two-way table is shown below.

	Bought souvenir	Did not buy	Total
Adult	9	21	30
Child	15	15	30
Total	**24**	**36**	**60**

(a) Find the probability that a randomly chosen visitor from the sample bought a souvenir. **(2)**

.....

(b) There are 900 visitors to the museum on Saturday. Use the table to estimate the number of these visitors who will buy a souvenir. **(3)**

(Total for Question 3 is 5 marks)

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4 Year 10 has 15 boys and 34 girls. Year 11 has 27 boys and 17 girls.
Write the ratio of all the boys to all the girls in its simplest form.

(Total for Question 4 is 3 marks)

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5 Of 44 boys, 10 are in Year 10 and the rest are in Year 11. Of 31 girls, 20 are in Year 10 and the rest are in Year 11.

What percentage of the boys are in Year 10? Give your answer correct to 1 decimal place.

(Total for Question 5 is 3 marks)

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6 Priya Chandra manages Riverside Car Park. She recorded how many cars and vans were parked there in the morning and in the afternoon. Complete the two-way table.

Vehicles at Riverside Car Park

	Morning	Afternoon	Total
Cars	45		
Vans		25	
Total	60		120

(Total for Question 6 is 5 marks)

7 A two way table shows types of transport used by 40 students and whether they are in Year 7 or Year 8.

	Year 7	Year 8	Total
Bus	12	8	20
Walk	6	4	10
Cycle	2	8	10
Total	20	20	40

Work out the probability that a student chosen at random is in Year 7 given that they ride the bus. Give your answer as a fraction in lowest terms.

(Total for Question 7 is 3 marks)

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8 Ade Okafor surveyed 120 adults about whether they prefer to read a Tabloid or a Broadsheet newspaper. The number of males who prefer a Tabloid is 2x, and the number of females who prefer a Tabloid is (x + 10). 28 males prefer a Broadsheet, and 37 females prefer a Broadsheet.

	Tabloid	Broadsheet	Total
Male	2x	28	
Female	(x + 10)	37	
Total			**120**

(a) Form and solve an equation to find the value of x. **(3)**

.....

(b) Work out the total number of male adults in the survey. **(2)**

.....

(Total for Question 8 is 5 marks)

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9 Grace Adeyemi is a quality control supervisor at a factory. 300 items were tested for faults using two machines, A and B. Machine A tested 3/5 of all 300 items, and Machine B tested the rest. Of the items tested by Machine A, 1 in 20 were found to be faulty. Of the items tested by Machine B, 15% were found to be faulty.

(a) Work out the number of items tested by Machine A and the number of items tested by Machine B. **(3)**

(b) Complete a two-way table to show the number of faulty and non-faulty items for each machine. **(4)**

(c) Work out the total number of faulty items out of the 300 tested. **(2)**

(Total for Question 9 is 9 marks)

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10 A census of 80 households gives:
31 have a dog, 28 have a cat, 10 have both a dog and a cat.

Complete the 2 by 2 table and find how many households have neither a dog nor a cat.

(Total for Question 10 is 2 marks)

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11 A community centre asked 70 visitors whether they used the gym and whether they attended a class. The partially completed two way table is below.

	Attend class	Do not attend class	Total
Use gym	28	?	40
Do not use gym| 12	?	30	
Total	40	30	70

(a) Work out the value of the entry marked ? in the Use gym row. **(1)**

.....

(b) Work out the value of the other ? in the Do not use gym row. **(1)**

.....

(c) Find the probability that a visitor both uses the gym and attends a class. **(2)**

.....

(Total for Question 11 is 4 marks)

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Mark scheme · 3.20 Two Way Tables: 1-hour Pack

Question 1

10 cao **B1**

Answer: 10

Question 2

(a) 24 cao **B1**

(a) Answer: 24

(b) 10/60 oe **M1**

(b) 1/6 oe cao **A1**

(b) Answer: 1/6

(c) 26/30 oe **M1**

(c) 13/15 oe cao **A1**

(c) Answer: 13/15

Question 3

(a) 24/60 oe **M1**

(a) 2/5 oe cao **A1**

(a) Answer: 2/5

(b) 2/5 (or 24/60) identified as the proportion, ft their (a) **M1**

(b) 2/5 x 900 oe **M1**

(b) 360 cao **A1**

(b) Answer: 360

Question 4

42:51 found **M1**

divides by the common factor **M1**

14:17 **A1**

Answer: 14:17

Question 5

10 / 44 **M1**

x 100 **M1**

22.7% **A1**

Answer: 22.7%

Question 6

Afternoon column Total = 60 cao **B1**

Vans Morning = 15 cao **B1**

Cars Afternoon = 35 cao **B1**

Cars Total = 80 cao **B1**

Vans Total = 40 cao **B1**

Answer: Afternoon Total = 60, Vans Morning = 15, Cars Afternoon = 35, Cars Total = 80, Vans Total = 40

Question 7

identify conditional probability: Year 7 and bus over total bus = 12/20 **M1**

12/20 simplified to 3/5 cao **A1**

answer given in lowest terms 3/5 cao **B1**

Answer: 3/5

Question 8

(a) 2x + 28 + (x + 10) + 37 = 120 oe, a correct equation formed **M1**

(a) 3x + 75 = 120 leading to 3x = 45, correct simplification **M1**

(a) x = 15 cao **A1**

(a) Answer: x = 15

(b) 2(15) + 28 oe, ft their x **M1**

(b) 58 cao (ft their x) **A1**

(b) Answer: 58

Question 9

(a) 3/5 x 300 oe **M1**

(a) Machine A = 180 cao **A1**

(a) Machine B = 300 - 180 = 120, ft their Machine A **B1ft**

(a) Answer: Machine A = 180, Machine B = 120

(b) 180 x 1/20 oe (or 180 x 0.05) **M1**

(b) Machine A faulty = 9 cao **A1**

(b) 120 x 0.15 oe **M1**

(b) Machine B faulty = 18 cao **A1**

(b) Answer: Machine A: Faulty = 9, Not faulty = 171, Total = 180. Machine B: Faulty = 18, Not faulty = 102, Total = 120.

(c) 9 + 18 oe, ft their (b) **M1**

(c) 27 cao **A1**

(c) Answer: 27

Question 10

use inclusion-exclusion: at least one = 31 + 28 - 10 = 49 oe **M1**

neither = 80 - 49 = 31 cao **A1**

Answer: 31

Question 11

(a) 12 cao **B1**

(a) Answer: 12

(b) 18 cao **B1**

(b) Answer: 18

(c) write fraction 28/70 or 28 divided by 70 **M1**

(c) 2/5 cao **A1**

(c) Answer: 28/70 or 2/5

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