5.5 Two-Way Tables and Frequency Trees: 1-hour Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Stretch: A frequency tree for 360 customers first splits by membership: 75% are members, 25% non-members. Of members, 40% buy product P; of non-members, 10% buy product P. Use the tree to find how many customers buy product P, and then find the probability that a randomly chosen customer is a member who bought P.

(4)

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2 92 people were asked about their choice. The two-way table shows the results. Adults: Pizza 20, Pasta 12, Salad 6; Children: Pizza 17, Pasta 18, Salad 19.
How many people chose Pasta?

(1)

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3 The two-way table shows how 71 people travel to work.
Boys: Football = 27, Netball = 9.
Girls: Football = 27, Netball = 8.
One person is chosen at random. Work out the probability that the person is in Boys and in Football.

(1)

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4 The two-way table shows some information about Adults and Children.
Adults: Bus = 20, Car = ?, total = 49.
Children: Bus = ?, Car = ?, total = 44.
Total for Bus = 43.
Work out the three missing values.

(3)

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5 The numbers of pets owned by 20 pupils are: 4, 7, 5, 3, 5, 7, 3, 6, 7, 5, 3, 4, 4, 6, 5, 3, 7, 6, 7, 5.
Complete a frequency table to find how many pupils own 4 pets.

(2)

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6 76 people were asked about their choice. The two-way table shows the results. Year 7: bus 3, walk 20, car 18; Year 8: bus 5, walk 18, car 12.
One of the Year 7 is chosen at random. Work out the probability that this person chose bus. Give your answer as a fraction in its simplest form.

(2)

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7 The two-way table shows some information about Year 7 and Year 8.
Year 7: Tea = 6, Juice = ?, total = 30.
Year 8: Tea = ?, Juice = ?, total = 24.
Total for Tea = 25.
Work out the three missing values.

(3)

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8 The numbers of pets owned by 16 pupils are: 4, 3, 7, 6, 6, 3, 3, 6, 6, 7, 4, 6, 3, 3, 4, 3.
Complete a frequency table to find how many pupils own 3 pets.

(2)

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9 The two-way table shows how 49 people travel to work.
Adults: Bus = 5, Car = 5.
Children: Bus = 12, Car = 27.
One person is chosen at random. Work out the probability that the person is in Adults and in Bus.

(1)

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10 62 people were asked about their choice. The two-way table shows the results. Boys: Art 19, Music 7, Drama 8; Girls: Art 5, Music 20, Drama 3.
One of the Boys is chosen at random. Work out the probability that this person chose Art.
Give your answer as a fraction in its simplest form.

(2)

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11 The numbers of pets owned by 23 pupils are: 5, 5, 5, 7, 6, 5, 5, 8, 7, 4, 6, 4, 8, 7, 8, 4, 7, 7, 8, 4, 6, 5, 8.
Complete a frequency table to find how many pupils own 8 pets.

(2)

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12 The two-way table shows how 78 people travel to work.
Year 7: Tea = 16, Juice = 15.
Year 8: Tea = 26, Juice = 21.
One person is chosen at random. Work out the probability that the person is in Year 7 and in Tea.

(2)

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13 70 people were asked about their choice. The two-way table shows the results. Boys: Art 18, Music 16, Drama 7; Girls: Art 3, Music 19, Drama 7.
One of the Boys is chosen at random. Work out the probability that this person chose Art. Give your answer as a fraction in its simplest form.

(2)

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14 74 people were asked about their choice. The two-way table shows the results. Adults: Pizza 12, Pasta 19, Salad 5; Children: Pizza 19, Pasta 13, Salad 6.
How many Adults were asked?

(1)

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15 The two-way table shows how 95 people travel to work.
Year 7: Tea = 30, Juice = 18.
Year 8: Tea = 28, Juice = 19.
One person is chosen at random. Work out the probability that the person is in Year 7 and in Tea.

(2)

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16 62 people were asked about their choice. The two-way table shows the results. Adults: Pizza 6, Pasta 12, Salad 12; Children: Pizza 5, Pasta 16, Salad 11.
How many Adults were asked?

(1)

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17 A two-way table shows results of 40 runners who wear either brand X or brand Y trainers and either sprint or run long distance.

	Sprint	Long distance	Total
Brand X	10	6	16
Brand Y	?	14	24
Total	20	20	40

Find the number of Brand Y runners who sprint.

(2)

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18 80 people were asked about their choice. The two-way table shows the results. Adults: Pizza 6, Pasta 20, Salad 17; Children: Pizza 3, Pasta 17, Salad 17.
One of the Adults is chosen at random. Work out the probability that this person chose Pizza. Give your answer as a fraction in its simplest form.

(2)

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19 The numbers of pets owned by 21 pupils are: 7, 7, 6, 5, 7, 4, 8, 4, 4, 7, 4, 7, 5, 6, 6, 4, 4, 7, 4, 6, 5.
What fraction of the pupils own exactly 4 pets? Give your answer in its simplest form.

(3)

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20 A pet survey of 50 animals shows 32 dogs (of which 20 are male and 12 are female) and 18 cats (of which 8 are male and 10 are female). Calculate the total number of female pets.

(2)

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21 In a two-way table of 200 people, 130 are employed and 70 are unemployed. Of the employed people, 91 work full-time and the rest work part-time. Calculate the probability that a randomly selected person from the 200 works part-time, giving your answer as a fraction in simplest form.

(3)

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22 A two-way table shows 250 concert tickets sold: 150 for adults and 100 for children. Of the adult tickets, 96 were bought online. Of the children tickets, 40 were bought online. Find the total number of tickets bought online, and the probability that a randomly chosen ticket was bought online, as a decimal.

(3)

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Mark scheme · 5.5 Two-Way Tables and Frequency Trees: 1-hour Pack

Question 1

members count = 0.75 * 360 = 270, non-members = 90	M1
members buying P = 0.40 * 270 = 108; non-members buying P = 0.10 * 90 = 9	M1
total buying P = 108 + 9 = 117	M1
probability member and P = 108/360 = 3/10 cao	A1

Answer: **117; 3/10**

Question 2

30 cao	B1

Answer: **30**

Question 3

27/71 cao	B1

Answer: **27/71**

Question 4

49 - 20	M1
43 - 20 or 44 - (43 - 20)	M1
29, 23, 21 cao	A1

Answer: **Adults Car = 29, Children Bus = 23, Children Car = 21**

Question 5

systematic counting or a tally of the data	M1
3 cao	A1

Answer: **3**

Question 6

total for Year 7 = 41	M1
3/41 cao	A1

Answer: **3/41**

Question 7

30 - 6	M1
25 - 6 or 24 - (25 - 6)	M1
24, 19, 5 cao	A1

Answer: **Year 7 Juice = 24, Year 8 Tea = 19, Year 8 Juice = 5**

Question 8

systematic counting or a tally of the data	M1
6 cao	A1

Answer: **6**

Question 9

5/49 cao	B1

Answer: **5/49**

Question 10

total for Boys = 34	M1
19/34 cao	A1

Answer: **19/34**

Question 11

systematic counting or a tally of the data	M1
5 cao	A1

Answer: **5**

Question 12

16/78	M1
8/39 cao	A1

Answer: **8/39**

Question 13

total for Boys = 41	M1
18/41 cao	A1

Answer: **18/41**

Question 14

36 cao	B1

Answer: **36**

Question 15

30/95	M1
6/19 cao	A1

Answer: **6/19**

Question 16

30 cao	B1

Answer: **30**

Question 17

use row total: 24 - 14 = 10 (consistent with column total 20 - 10 = 10)	M1
10 cao	A1

Answer: **10**

Question 18

total for Adults = 43	M1
6/43 cao	A1

Answer: **6/43**

Question 19

frequency 7 found	M1
7/21	M1
1/3 cao	A1

Answer: **1/3**

Question 20

identifies female dogs 12 and female cats 10	M1
22 cao	A1

Answer: **22**

Question 21

part-time employed = 130 - 91 = 39	M1
probability set up as 39/200	M1
39/200 cao (already simplest form)	A1

Answer: **39/200**

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Question 22

total online = 96 + 40 = 136	**M1**
probability set up as 136/250	**M1**
0.544 cao	**A1**

Answer: **136; 0.544**

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