Contingency tables

Answers

Further Maths topic practice

This topic online

Q	Answer	Marks
1	**a)** Walk, KS3 40; Walk, KS4 40; Car, KS3 60; Car, KS4 60 **b)** 1	3
2	**a)** H0: sport and year group independent, H1: not independent **b)** 18.20 **c)** $\nu = 6$, critical value 12.592	4
3	H0: no association, H1: association. Expected 32, 28, 48, 42; $\chi^2 = 4.018 > 3.841$ (1 df), so reject H0: there is evidence of an association between owning a pet and where the household lives.	7
4	**a)** Under 40: 40, 45, 35; 40 and over: 40, 45, 35 **b)** $\chi^2 = 7.692 > 5.991$, reject H0: association	8
5	**a)** Year 13, more than 8 h: 14.67 **b)** all $E \geq 5$, no combining needed **c)** 17.09 > 13.277, reject H0: association	6
6	**a)** 3.33, 3.07, 3.60, all < 5: combine Cycle with Walk **b)** $\chi^2 = 9.897$, $\nu = 4$, reject H0: association	10
7	**a)** $E = 48$, $c = 3.000$ **b)** $\chi^2 = 9.633 > 5.991$, reject H0 **c)** morning: more hot drinks, fewer cold drinks than expected if independent	8
8	H0: voting and age group are independent, H1: they are associated. $\chi^2 = 19.143$, $\nu = 3$, critical value 11.345; reject H0: there is evidence of an association between age group and voting.	9
9	**a)** $\chi^2 = 1.667 < 3.841$, do not reject H0 **b)** $\chi^2 = 3 \times 1.667 = 5.000 > 3.841$, reject H0 **c)** the statistic depends on the observed frequencies; percentages are not frequencies and would change χ^2	10
10	**a)** $E = 4.44, 3.78, 3.78 < 5$; join the adjacent age group **b)** $\chi^2 = 16.678 > 9.488$, reject H0 **c)** 60 and over visit weekly more than expected; under 35 rarely visit more than expected	10
11	**a)** 50 **b)** $\chi^2 = 2.020 < 3.841$, do not reject H0	8
12	**a)** $\chi^2 = 10.289 > 5.991$, reject H0 **b)** grade 4 or below cells: users got low grades less often than expected, non-users more often **c)** association, not causation: other factors (such as motivation) may explain it	10

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.

Full worked solutions, written out by hand, are on the solutions sheet for this topic.

Free for classroom and home use: print, photocopy and share. Not for resale or re-hosting.