

Two-Way Tables and Relative Frequencies

Grade 8 math · Test Answer Key · Standards: 8.SP.A.4

Award points as shown in each scoring note. Accept percents within one point of the stated answer when rounding differs, and accept any clear explanation that compares percents between groups rather than raw counts.

Standards: 8.SP.A.4 · **Level:** Grade 8

Question 1 Complete the totals (2 points)

(a) $21 + 14 = 35$ and $29 + 26 = 55$.

(b) $21 + 29 = 50$, $14 + 26 = 40$, and $35 + 55 = 90$.

Part-time job	Plays a sport	No sport	Total
Has a job	21	14	35
No job	29	26	55
Total	50	40	90

Completed table.

Rows 35 and 55; columns 50 and 40; total 90

Scoring: 1 point per part.

Question 2 Row relative frequencies (3 points)

(a) $21 \div 35 = \mathbf{60\%}$

(b) $29 \div 55 \approx 52.7\%$, so **53%**

(c) The percents are 60% and 53%, only 7 points apart: **a weak association at most.**

Scoring: 1 point per part.

Question 3 Column relative frequencies (3 points)

(a) $21 \div 50 = \mathbf{42\%}$

(b) $14 \div 40 = \mathbf{35\%}$

(c) These divide by column totals (sport or no sport), while Question 2 divided by row totals (job or no job), so they answer different questions.

Scoring: 1 point per part.

Question 4 Build a table from a list (3 points)

(a) (D, Y) appears 5 times, (D, N) 2 times, (C, Y) 2 times, (C, N) 3 times.

	Has sibling	No sibling	Total
Prefers dogs	5	2	7
Prefers cats	2	3	5
Total	7	5	12

(b) The totals are 7 and 5 for the rows, 7 and 5 for the columns, and 12 overall.

Scoring: part (a) 2 points for all four counts (1 point if two or three are correct); part (b) 1 point.

Question 5 Segmented bars (3 points)

(a) **Ages 8 to 12** (78% compared with 41%).

(b) The percents differ by 37 points, so **yes, there is an association**: older riders are less likely to wear a helmet.

Scoring: part (a) 1 point; part (b) 1 point for the comparison, 1 point for the conclusion.

Question 6 Evaluate a claim (2 points)

Adults: $54 \div 300 = 18\%$. Youths: $36 \div 150 = 24\%$.

Ben is not correct: youths are more likely to buy a pass (24% versus 18%)

Scoring: 1 point for each correct percent, with a correct conclusion.

Question 7 Fill in the table (2 points)

Top-right: $90 - 55 = 35$. Bottom-left: $100 - 55 = 45$. Bottom-right: $70 - 45 = 25$ (also $60 - 35 = 25$).

35, 45, and 25

Scoring: 1 point for the top-right and bottom-left, 1 point for the bottom-right with a check.

Question 8 No association (2 points)

The percents are almost equal, so the choice in the columns does not depend much on the row group.

There is little or no association

Scoring: 1 point for the conclusion, 1 point for the explanation.