

Reading Two-Way Tables and Scatter Plots

Grade 9 – Algebra 1 math · Test Answer Key · Standards: S-ID.B.5, S-ID.B.6, S-ID.C.7, S-ID.C.8, S-ID.C.9

Use this answer key to score the test out of 20 points. Each solution lists where points are earned. Accept answers rounded to the nearest tenth when a decimal is requested, and accept equivalent wording for interpretations.

Standards: S-ID.B.5, S-ID.B.6, S-ID.C.7, S-ID.C.8, S-ID.C.9 · **Level:** Grade 9 Algebra 1

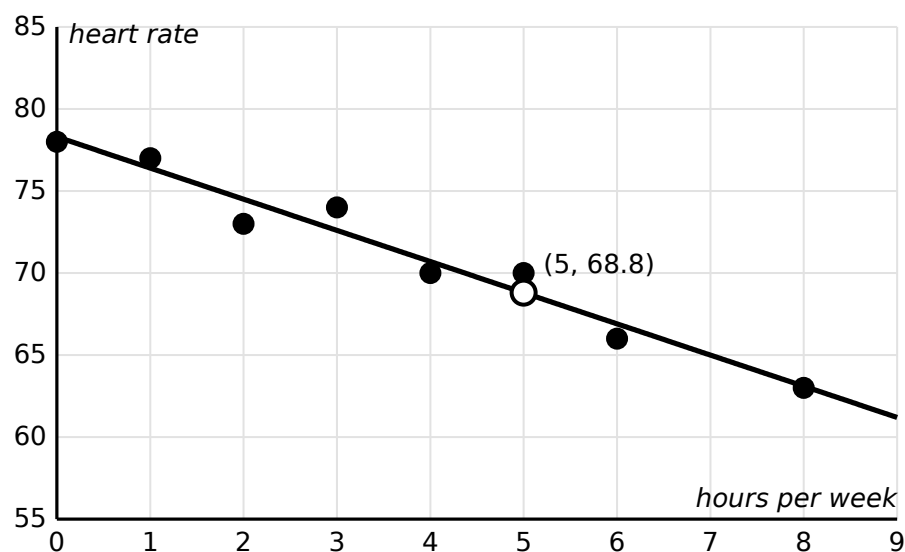
Question 1 Two-Way Table (3 points)

- a. $39 \div 120 = \mathbf{0.325 (32.5\%)}$.
- b. $54 \div 120 = \mathbf{0.45 (45\%)}$.
- c. $27 \div 60 = \mathbf{0.45 (45\%)}$.

Scoring: 1 point per part.

Question 2 Heart Rate and Workouts (3 points)

- a. **Negative and strong:** more workout time goes with a lower heart rate, and the points hug the line.
- b. Each extra hour of workout per week is associated with a resting heart rate about **1.9 beats per minute lower**.
- c. $-1.9(5) + 78.3 = \mathbf{68.8}$, about **69 beats per minute**.



Prediction at 5 hours: about 69 beats per minute.

Scoring: 1 point per part.

Question 3 Find Residuals (2 points)

- a. Predicted: $2.5(6) + 10 = 25$. Residual: $28 - 25 = +3$.
- b. Predicted: $2.5(10) + 10 = 35$. Residual: $31 - 35 = -4$.

Scoring: 1 point per part.

Question 4 Interpret a Correlation Coefficient (2 points)

- a. **A strong negative linear relationship:** as x rises, y tends to fall, and the value is close to -1 .
- b. Correlation alone does not prove cause. **A lurking variable might affect both**, so only an experiment could show that x causes the decrease.

Scoring: 1 point per part.

Question 5 Line Through Two Points (3 points)

- a. $(50 - 14) \div (8 - 2) = 6$. **Each extra guest adds \$6.**
- b. $14 = 6(2) + b$, so $b = 2$: **$y = 6x + 2$.**
- c. $6(12) + 2 = \mathbf{\$74}$.

Scoring: 1 point per part.

Question 6 Residual Plot (2 points)

- a. **Yes**, a linear model is appropriate.
- b. The residuals are scattered above and below 0 with no pattern, and they are small.

Scoring: 1 point per part.

Question 7 Correlation and Causation (3 points)

- a. A **moderate positive** linear relationship: students who eat breakfast tend to have higher scores.
- b. **No**. The study shows association, not cause and effect.
- c. For example **family income, sleep or study habits** could affect both breakfast and scores.

Scoring: 1 point per part.

Question 8 Compare Two Models (2 points)

Sum of squares: $A = 16 + 1 + 4 + 9 = 30$; $B = 1 + 4 + 1 + 4 = 10$.

Model B fits better because its sum of squared residuals is smaller.

Scoring: 1 point for both sums, 1 point for the conclusion.