eClassroom

GCSE Mathematics

Scatter Graphs

Worked Solutions

Pearson Edexcel GCSE & iGCSE Mathematics

Section A — Foundation — Worked Solutions

[Fluency] Question 1

(a) Positive correlation

(b) Negative correlation

(c) No correlation

∴ **(a) Positive (b) Negative (c) No correlation**

[Fluency] Question 2

Points plotted as × at each (height, weight) coordinate

(b) Strong positive correlation

(c) Straight line through the middle of the points, roughly equal points each side

∴ **(b) Strong positive correlation (c) LOBF drawn ✓**

[Fluency] Question 3

$w = 0.867 \times 172 - 78.67 \approx 70.4$ kg

∴ **≈ 70 kg**

[Reasoning] Question 4

(b) Strong positive correlation

(d) Read from LOBF at x=16: ≈ 73 ice creams

∴ **(b) Strong positive correlation (d) ≈ 73**

[Reasoning] Question 5

(b) Read from LOBF at x=30: ≈ 102

(c) Not reliable — 30°C is outside the data range (extrapolation). Relationship may not continue.

∴ **(b) ≈102 (c) Unreliable (extrapolation)**

[Reasoning] Question 6

(a) Strong positive correlation

(b) The student revised for 5 hours but scored much lower than expected — may have been ill, or other factors.

(c) Read from LOBF at x=6.5: ≈ 70%

∴ **(a) Strong positive (b) Anomalous point — possible illness/distraction (c) ≈70%**

[Problem Solving] Question 7

Interpolation: estimating within the range of the data — more reliable.

Extrapolation: estimating outside the range — less reliable, as the pattern may not continue.

∴ **Interpolation more reliable (within data range)**

[Problem Solving] Question 8

Correlation ≠ causation. A third variable (e.g. how much time students spend studying) may explain both.

We cannot conclude that TV watching causes lower scores from a scatter graph alone.

∴ **Correlation does not imply causation — a third variable may be responsible.**

Section B — Higher — Worked Solutions

[Fluency] Question 1

$(a)\ w = 0.867h - 78.67$

$(b)\ w = 0.867 \times 168 - 78.67 \approx 67.0 \text{ kg}$

(c) h=210 cm is outside the data range — extrapolation — unreliable.

∴ **(a) w=0.867h−78.67 (b) ≈67.0 kg (c) Unreliable**

[Fluency] Question 2

(a) Strong negative correlation

(b) As one variable increases, the other decreases, and the relationship is very strong (close to −1).

∴ **(a) Strong negative correlation**

[Reasoning] Question 3

Flaw: correlation does not imply causation.

A lurking variable — age — explains both. Older children have bigger feet AND better spelling skills.

Foot size does not cause better spelling.

∴ **Age is the lurking variable; foot size does not cause better spelling.**

[Reasoning] Question 4

(b) LOBF gradient $\approx \frac{14-1}{2-14} = -\frac{13}{12} \approx -1.08$

$y = -1.08x + 16.2$ (approx)

$(c)\ y = -1.08 \times 9 + 16.2 \approx 6.5$

∴ **(b) y ≈ −1.08x + 16.2 (c) ≈ 6.5**

[Reasoning] Question 5

(a) No/very weak correlation

(b) No — a line of best fit is not appropriate when there is no clear linear relationship.

∴ **(a) No correlation (b) Not appropriate**

[Problem Solving] Question 6

(b) LOBF: Sales $\approx 3.8 \times$ Advert $+ 10.4$

(c) Sales $= 3.8 \times 6 + 10.4 = 23.2 + 10.4 = 33.6 \approx 33{,}600$

(d) The line of best fit is an estimate; actual values may vary due to other factors.

$\therefore$ **(b) Sales $\approx$ 3.8×Advert + 10.4 (c) ≈£33,600**