

Solutions

Authored self-check guidance: accept equivalent correct methods and supported interpretations. The points check reasoning, not an official grade.

2.1 **A** – $26-30=-4$. **B** reverses observed minus predicted; **C** adds values that must be subtracted.

Correct response linked to the given case.

2.2 **A** – 5 is inside the observed range. **B** requires an input outside 2–8; **C** makes a causal claim that interpolation cannot establish.

Correct response linked to the given case.

2.3 $18 - 4 + 2 \cdot 7 = 18$.

Correct response linked to the given case.

2.4 False – Confounding or other explanations can produce association.

Correct response linked to the given case.

3.1 The intercept predicts 8 minutes at zero distance; zero lies outside the observed range, so this interpretation is extrapolated. The slope predicts an extra 1.5 minutes per kilometre. $T(6) = 8 \text{ min} + (1.5 \text{ min/km})(6 \text{ km}) = 17 \text{ min}$. Residual $e = 15 \text{ min} - 17 \text{ min} = -2 \text{ min}$, below the line.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.

3.2 Seven is inside 2–10, so interpolation. Twenty is outside, so extrapolation with weaker support. Traffic, loading and other conditions can influence time; a fitted association does not isolate their effects.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.

3.3 Ratios are all 3, while differences vary. The exponential rule is $y = 6(3)^x$. Under continued factor-three growth, $y(4) = 6(3)^4 = 486$. This is a model-based extrapolation, not a guaranteed next observation.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.