

Solutions

2.1 Substitute distance 5: $8+2\times 5=18$ minutes.

2.2 Residual=observation-prediction= $21-18=3$ minutes.

2.3 Compound annually: $1000\times 1.05^3=1157.625$.

2.4 False. A good fit does not prove a causal mechanism. A correlation coefficient measures linear association, not the gradient. Calculator output must be translated into a model, checked and interpreted.

2.5 A The observed value minus the value predicted by a fitted model.

3.1 Prediction 18, residual+3 minutes; at 50 prediction 108. If the fitted distance range was short, this is extrapolation; traffic, stops and model form may change. Regression does not establish a causal coefficient by itself.