Interpreting slope/intercept

6 questions | 18 marks

Equivalent correct methods earn the corresponding marks.

1. A fitted crop yield is Y=2+0.4R, with Y in tonnes and R in mm rainfall. Interpret 0.4. [3 marks]

State response units per explanatory unit.

Qualify the statement as a model prediction.

Answer: The model predicts 0.4 more tonnes for each additional mm of rainfall.

2. A model T=90-2.5x predicts test time in minutes from weeks of training. Interpret -2.5. [3 marks]

The negative sign indicates a decrease.

Answer: Each extra training week predicts a 2.5-minute decrease in test time.

3. A tree model h=1.2+0.7t was fitted only for ages 5-12 years. Is 1.2 m a reliable measured height at birth? [3 marks]

Zero is outside the observed age range.

Answer: No. It is the extrapolated prediction at age zero, not a measured birth height.

4. Change $y=4+12x$ from x hours to t minutes. [3 marks]

Substitute $x=t/60$.

$12/60=0.2$.

Answer: $y=4+0.2t$.

5. The model $y=5+0.03x$ uses x in dollars. Express it with z in hundreds of dollars. [3 marks]

$x=100z$.

$0.03\times100=3$.

Answer: $y=5+3z$.

6. A regression gives an intercept of -8 for mass predicted from length. Must the entire model be useless? [3 marks]

A negative extrapolated zero-length prediction does not alone invalidate a local fitted relationship.

Answer: No. The intercept may be outside the relevant length range; inspect fit and predictions within that range.