NCEA Level 1 · AS 91946: Making Sense of Maths in Context

Name: _____ Date: _____

This standard is all about reading real information, graphs, tables, formulae and models, then using it to answer questions and back up your thinking. Work through each section in order, and always ask yourself 'what does this number actually mean here?'

Revision summary

- Read carefully: check axis labels, units, scales, headings and the key before you calculate.
- To apply a formula, substitute the given values, keep units consistent, then solve step by step.
- Rate = amount ÷ time (e.g. $/hour, km/h). Cost models often look like: total = fixed charge + rate × quantity.
- Percentage change = (new − old) ÷ old × 100. To increase by r%, multiply by (1 + r/100).
- Reading a graph: interpolate between points; a steeper line means a faster rate of change.
- Justify conclusions with evidence, quote actual numbers from the source, and state any assumptions.
- For Merit, link two or more pieces of information together (e.g. compare two plans, connect a table to a graph).
- For Excellence, generalise (write a rule), prove why a claim is true or false, or evaluate which option is best and defend it.

Key skills

1. A water tank fills at a steady rate. After 3 minutes it holds 240 litres. What is the filling rate in litres per minute?

2. A jacket priced at $80 is discounted by 25%. What is the sale price?

3. A phone plan costs $15 per month plus $0.10 per text. Write a formula for the total cost C (in dollars) for t texts in a month.

4. A line graph of a car's distance shows it travelled 150 km in 2 hours at a steady speed. What was its speed?

Achieved

5. Aroha earns $22.50 per hour at a café in Avondale. One week she works 18 hours. Using the model Pay = rate × hours, calculate her pay for the week.

6. A table shows daily rainfall in Auckland: Mon 4 mm, Tue 0 mm, Wed 12 mm, Thu 8 mm, Fri 6 mm. What was the total rainfall, and the mean daily rainfall over the five days?

7. A recipe for 4 people needs 600 g of flour. Kiri is cooking for 10 people. How much flour does she need?

8. A courier charges a $6 base fee plus $2.50 per kilometre. Use C = 6 + 2.50d to find the cost of a 14 km delivery.

Merit

9. Two gyms in West Auckland offer memberships. FitZone charges $40 joining fee plus $18 per month. PowerHouse charges no joining fee but $22 per month. After how many months do the two gyms cost the same amount, and what is that amount?

10. A shop increases a $250 bike price by 20% for the summer, then in autumn reduces the new price by 20%. A customer says 'the price is back to $250'. Show whether the customer is correct.

11. A graph shows a plant's height: 5 cm at week 0, growing steadily to 25 cm at week 4. Write a formula for the height h after w weeks, then use it to predict the height at week 7. State one reason the prediction may be unreliable.

Excellence

12. A phone company offers Plan A: $30 flat per month for unlimited data. Plan B: $10 per month plus $2 per GB. For what range of data usage is Plan A the cheaper choice? Justify your answer with a general argument.

13. A claim in a local newsletter states: 'Averaging 90 km/h over a 180 km trip means you can drive 100 km/h for the first half of the distance and 80 km/h for the second half.' Determine whether this claim is true, showing your reasoning.

14. A container's rental cost is modelled by C = 50 + 8d for d days. A rival offers a weekly rate of $90 per 7-day week (part weeks rounded up to a full week). Explain, with justification, for which numbers of days each option is cheaper.