



Modelling with a linear function

GRADE 8 MATH

Name _____

Date _____

Build the model, check it on BOTH readings, then say in words what the rate and the starting value mean. One skill: **modelling with a linear function**.

WORKED EXAMPLE

A tank holds 40 litres after 2 minutes and 100 litres after 8 minutes. The **rate** is a difference PER unit: 60 litres over 6 minutes = **10 a minute**. The **initial value** is the amount at $x = 0$, so work BACK: at 2 minutes it held 40, so at 0 it held $40 - 20 = 20$. Model: **$y = 10x + 20$** . Check both: $10(2) + 20 = 40$ ✓ and $10(8) + 20 = 100$ ✓. Then say what they MEAN — “gains 10 litres a minute”, “held 20 litres to begin with”.

1. A taxi costs £11 for 3 miles and £19 for 7 miles. Find the rate per mile.

APPLICATION

Show your thinking

Answer

2. Same taxi. What is the initial value, and what does it mean in this situation?

REASONING

Show your thinking

Answer

3. Write the model as an equation and check it on both readings.

APPLICATION

Show your thinking

Answer

4. Ali says the starting value is £11 because that is the first number given.
Explain his error.

REASONING

Show your thinking

Answer