Practice test 2 - Reading representations

Name: _____ Date: _____

10 questions | 53 marks | 60 minutes

Interpret equations, intervals, tables and financial comparisons, then justify predictions.

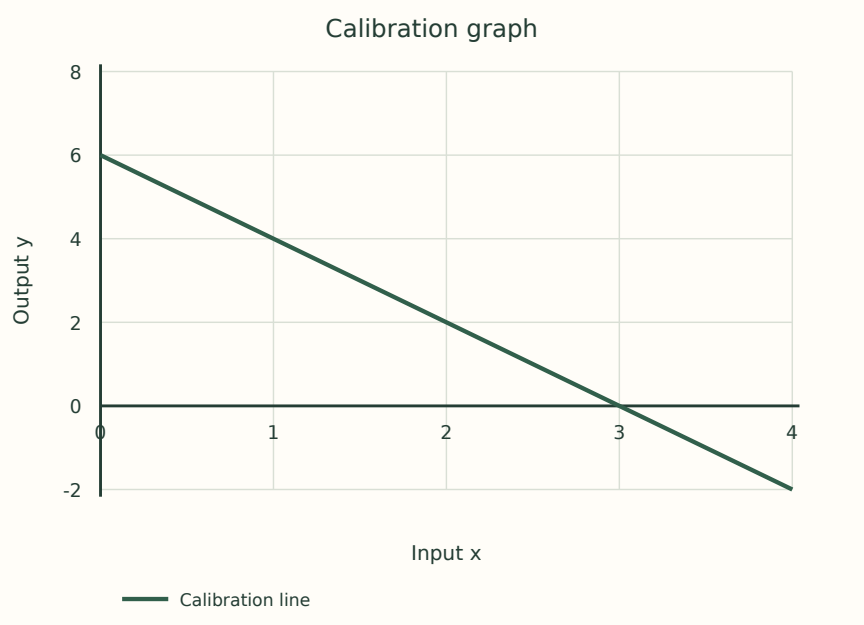
A scientific calculator may be used.

1. Use algebra before making a practical calculation. [4 marks]

(a) Solve $2(3x - 4) = 5x + 9$. [2 marks]

(b) The formula $A = (a + b)h/2$ has $A = 54$, $a = 4$ and $b = 8$. Find h. [2 marks]

2. Use the calibration graph below. Horizontal grid steps represent 1 input unit and vertical grid steps represent 2 output units. [6 marks]



(a) Read the two axis intercepts. [2 marks]

(b) Use two points on the graph to find the gradient and write the rule. [2 marks]

(c) Would $y = -2x + 9$ be parallel to the graphed line? Explain. [2 marks]

3. A cost table gives $(t, C) = (1, 12), (3, 20), (5, 28)$, with t in hours and C in dollars. [6 marks]

(a) Construct a linear cost rule. [2 marks]

(b) Interpret both parameters. [2 marks]

(c) Predict C at t = 4 and classify the prediction. [2 marks]

4. Plumber A charges $80 + 50h$ dollars and B charges $140 + 35h$ dollars. [6 marks]

(a) Find the equal-cost time and cost. [2 marks]

(b) Which is cheaper for 2 h? [2 marks]

(c) What is the first whole number of hours for which B is strictly cheaper? [2 marks]

5. Postage is 3 dollars for $0 < m \leq 250$ g, 5 dollars for $250 < m \leq 500$ g and 8 dollars for $500 < m \leq 1000$ g. [4 marks]

(a) Find charges for 400 g, 500 g and 501 g. [2 marks]

(b) Is the fee continuous at 500 g? Explain. [2 marks]

6. Consecutive values of a quantity are 100,90,81,72.9 starting at n = 0. [4 marks]

(a) Write an exponential rule and state the rate. [2 marks]

(b) Predict the value at n = 4. [2 marks]

7. A quantity grows from 200 to 242 over two equal steps. [5 marks]

(a) Find the positive multiplying factor and percentage growth per step. [2 marks]

(b) Find the first whole step at which the model exceeds 300. [3 marks]

8. A population begins at 60 and doubles every 3 years. Let t be years after the start. [6 marks]

(a) Write a model using t. [2 marks]

(b) Find the population predicted after 6 years. [2 marks]

(c) Find the annual multiplying factor, to four decimal places. [2 marks]

9. At t = 1 and t = 3, an exponential quantity is 50 and 98. A new value at t = 4 is 142. [6 marks]

(a) Find the positive step factor and a model. [2 marks]

(b) Predict P at 4 and calculate the residual. [2 marks]

(c) Why is the first observation not automatically the value at t = 0? [2 marks]

10. A club fitted $N = 200 + 15t$ to weekly attendance for t from 0 to 8. Its room holds 400 people. [6 marks]

(a) Predict attendance at t = 20 using the formula. [2 marks]

(b) Explain two reasons to question this prediction. [2 marks]

(c) Find when the rule reaches capacity. [2 marks]