Interpreting linear versus quadratic financial models

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. Classify $C = 12 + 7n$ and state the extra cost per item. [2 marks]

The input appears to the first power and the coefficient is 7.

Answer: Linear; AUD 7.00 per extra item.

2. Classify $C = n^2 + 2n + 8$. [2 marks]

The coefficient of n^2 is 1, not zero.

Answer: Quadratic

3. Find $C = n^2 + 2n + 8$ for $n = 0, 1, 2, 3$. [3 marks]

Substitute each input.

The first differences are $3, 5, 7$.

Answer: $8, 11, 16, 23$

4. Expand the revenue rule $R = n(20 - n)$. [2 marks]

Distribute n over the bracket.

Answer: $R = 20n - n^2$

5. For $R = n(20 - n)$, find revenue at $n = 6$ and the price per item. [3 marks]

Price $= 20 - 6 = 14$.

Revenue $= 6 \times 14 = 84$.

Answer: Revenue AUD 84.00; price AUD 14.00

6. Why is $n = 25$ unsuitable for a selling-price model $R = n(20 - n)$? [3 marks]

A sale price of negative five dollars does not match the stated selling context.

Restrict the model to a sensible range such as whole numbers $0 \le n \le 20$.

Answer: It gives a negative price, $20 - 25 = -5$ dollars.