Comparing linear/quadratic/exponential patterns

6 questions | 13 marks

Equivalent correct methods earn the corresponding marks.

1. Classify $3, 6, 9, 12$ at equal steps among linear, quadratic and exponential. [2 marks]

All first differences are 3.

Answer: Linear

2. Classify $2, 4, 8, 16$ at equal steps. [2 marks]

All consecutive ratios are 2.

Answer: Exponential

3. Classify $1, 4, 9, 16$ at equal steps. [2 marks]

First differences are $3, 5, 7$; second differences are 2.

Answer: Quadratic

4. Write an exponential rule for outputs $7, 14, 28, 56$ at $n = 0, 1, 2, 3$. [2 marks]

The initial value is 7 and the constant ratio is 2.

Answer: $y = 7(2^n)$

5. Find the next two values if $10, 20, 40$ continues with the same multiplicative rule. [2 marks]

Multiply by 2 at each step.

Answer: 80 and 160

6. A model doubles daily. Why is adding 20 each day not a valid general rule if it starts at 20? [3 marks]

Doubling gives $20, 40, 80, 160$. Adding 20 gives $20, 40, 60, 80$, so agreement ends after the first step.

Answer: The daily increase itself grows.