Discrete points versus continuous graphs

6 questions | 15 marks

Equivalent correct methods earn the corresponding marks.

1. Is the number of whole cars in a car park discrete or continuous? Explain. [2 marks]

Only whole-number car counts are possible.

Answer: Discrete.

2. Rope is sold by measured length. Is length discrete or continuous in a mathematical model? [2 marks]

Intermediate lengths such as 1.25 m are possible.

Answer: Continuous.

3. Tickets cost 8 dollars each and only whole tickets are sold. Is (1.5,12) allowed? [2 marks]

$1.5 \times 8 = 12$, but 1.5 tickets cannot be bought in this model.

Answer: No.

4. An empty tank fills steadily at 2 L/min. Find the volume at 2.5 min and classify the model. [3 marks]

$2 \times 2.5 = 5$.

Times between whole minutes are allowed.

Answer: 5 L; continuous.

5. The temperature is 20°C at noon and 24°C at 2 pm. Must it have been 22°C at 1 pm? Explain. [3 marks]

The actual temperature may change unevenly.

Answer: No. That is a straight-line model's prediction, not a fact established by two readings.

6. Why should the tops of bars for red, blue and green not be joined to claim a continuous numerical relationship? [3 marks]

A numerical halfway point between the colour categories has no meaning here.

Answer: The inputs are categories, not a numerical measurement scale.