Mathematics 10C

Unit RF: Relations and functions

Graphs of situations

A bus ride in time

- The bus waits 2 minutes.
- It drives for 6 minutes, then waits again.
- Time keeps moving between the notes.

Inputs and outputs

- In the pair (2, 7), the input is 2 and the output is 7.
- A joined segment means the story continues between the dots.

Key terms

domain

The set of input values that the graph, table, or ordered pairs actually uses. (x-values)

range

The set of output values that correspond to those inputs. (y-values)

discrete graph

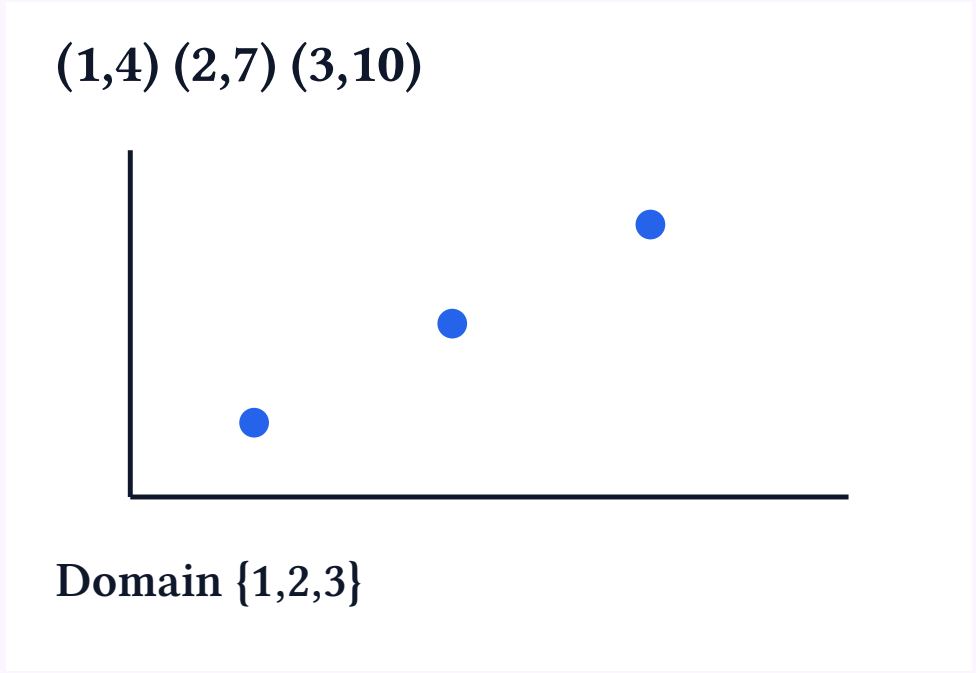
A graph of separate points, used when each point is its own count. (separate points)

continuous graph

A graph with the points joined, used when the quantity exists between the recorded values. (a joined line)

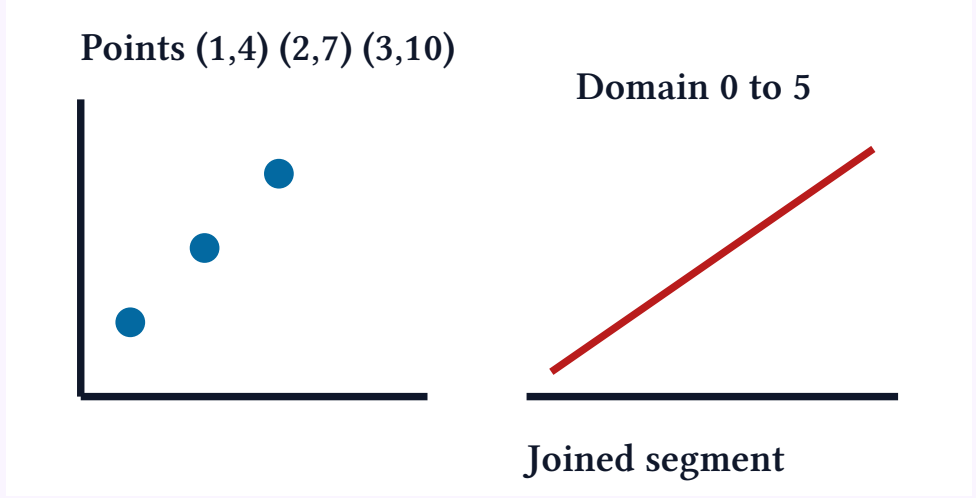
Domain and range of three points

- The pairs are (1, 4), (2, 7), and (3, 10).
- The domain is {1, 2, 3}.
- The range is {4, 7, 10}.



A segment from x = 0 to x = 5

- The segment runs from x = 0 to x = 5.
- The domain is $0 \le x \le 5$.
- If the heights run from 1 to 4, the range is $1 \le y \le 4$.

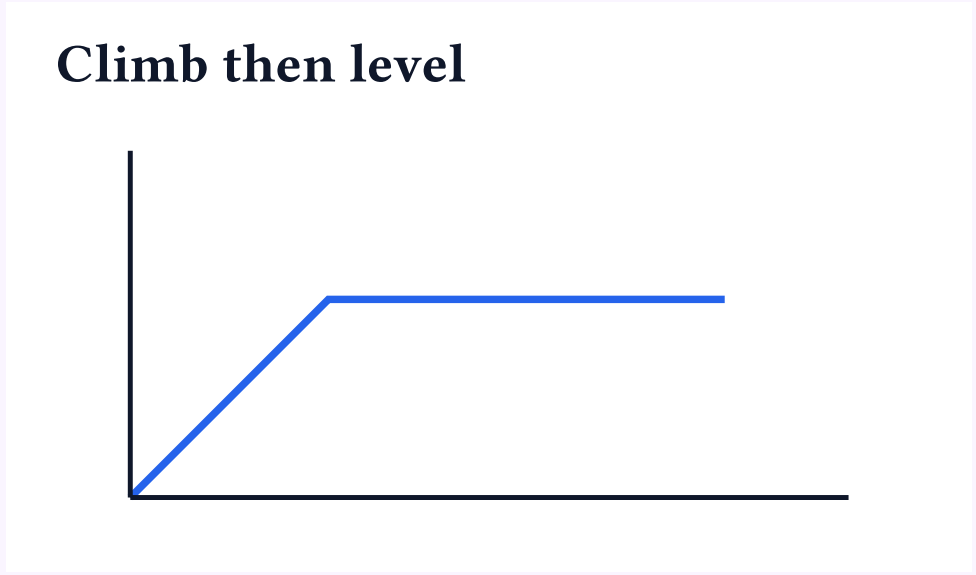


A fare table and a 12 km trip

- The table uses inputs 1, 2, and 3, so the domain is $\{1, 2, 3\}$.
- A trip from 0 km to 12 km has domain $0 \le d \le 12$.
- If the graph height runs from 0 to 12, the range is $0 \le y \le 12$.

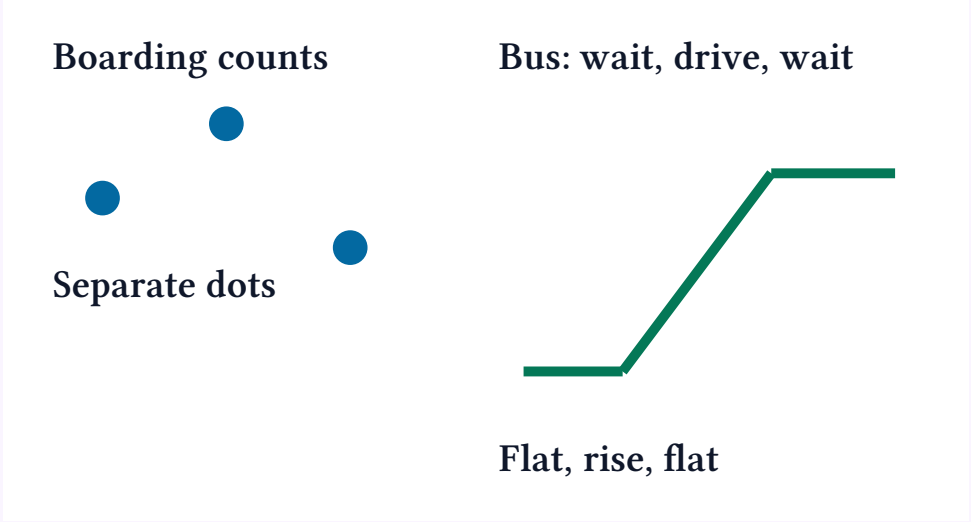
Join the points when the story continues

- From $x = 0$ to $x = 4$ the output climbs from 0 to 8.
- From $x = 4$ to $x = 7$ the output stays 8.
- The domain is $0 \le x \le 7$ and the range is $0 \le y \le 8$.



Dots for separate counts

- Riders boarding at each stop are separate counts.
- Those counts stay as dots.
- A line through the dots would invent riders between stops.



A bus trip graph

- Draw a flat piece for the first 2 minutes.
- Draw a rise for the next 6 minutes.
- Draw a flat piece for the last wait.

Quick check

- The pairs $(0, 2)$ and $(4, 2)$ have domain $\{0, 4\}$ and range $\{2\}$.
- A continuing walk between those times uses domain $0 \le t \le 4$.

Identifying a set

- Name the domain before you describe the shape.
- Join points only when the story continues between them.