

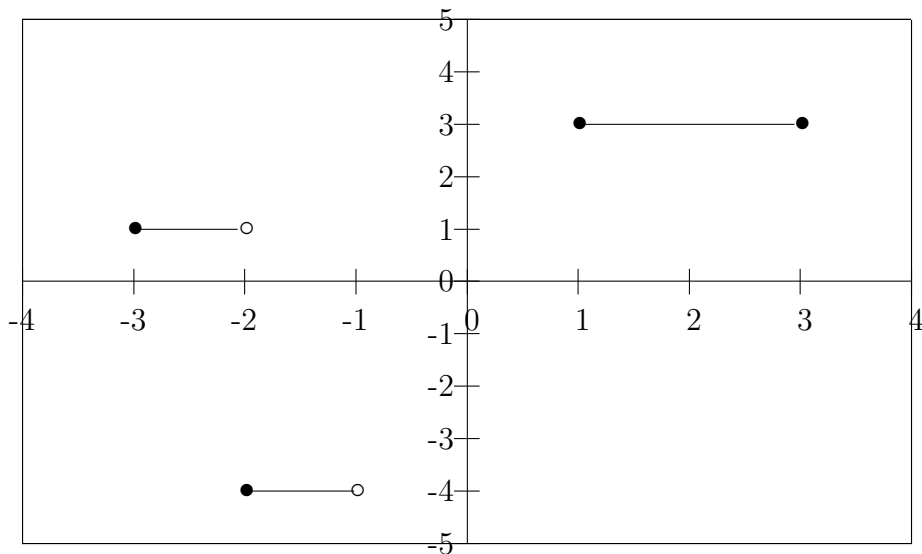
Functions with non-interval domains

So far, we've only looked at functions whose domains were intervals. For example, we looked at functions with domain \mathbb{R} , $[0, \infty[$, $[3, 3]$, and so on. However, any set can be the domain for a function

E.g. #1. $f : [-3, -1[\cup [1, 3]$

$$f(x) = \begin{cases} 1 & \text{if } -3 \leq x < -2 \\ -4 & \text{if } -2 \leq x < -1 \\ 3 & \text{if } 1 \leq x \leq 3 \end{cases}$$

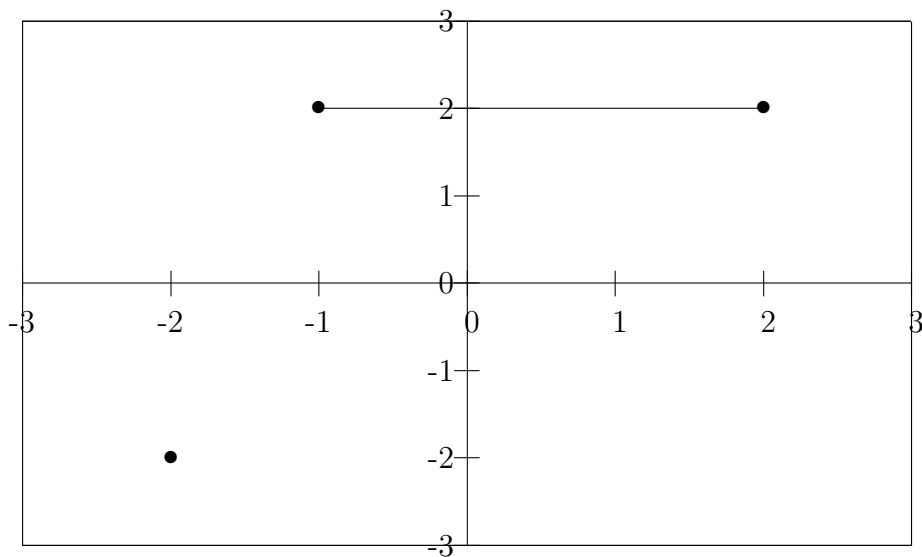
The graph for this function is:



Notice we can tell what the domain is from the function's mapping, as well as from the graph.

E.g. #2. $f : \{-2\} \cup [-1, 2]$

$$f(x) = \begin{cases} -2 & \text{if } x = -2 \\ 2 & \text{if } -1 \leq x \leq 2 \end{cases}$$



Homework

#1. (a) Find the domain of the following function, (b) sketch its graph, and (c) find the image of 0.

$$f(x) = \begin{cases} 2 & \text{if } -3 < x < -2 \\ 1 & \text{if } -2 < x \leq 1 \\ -1 & \text{if } x = 2 \end{cases}$$

#2. (a) Find the mapping and (b) domain for the function represented in the following graph. (c) Find the image of 2.

