

# Domain, Range & Functions

A relation between **x** and **y** pairs each **x**-value with one or more **y**-values.

The **domain** is the set of all possible **x**-values, or where the graph goes **horizontally**. The **range** is the set of all possible **y**-values, or where the graph goes **vertically**.

A relation is a **function** if each member in the **domain** is paired with exactly one member in the **range**.

A relation is **not** a **function** if any member in the **domain** is paired with **more than one** member in the **range**.

## Vertical line test

If a vertical line intersects **two or more** points on a graph, then that graph is **not** a **function**.

$\{(-3,2), (0,4), (1,5), (6,-1), (7,2)\}$

D:  $\{-3, 0, 1, 6, 7\}$

R:  $\{-1, 2, 4, 5\}$

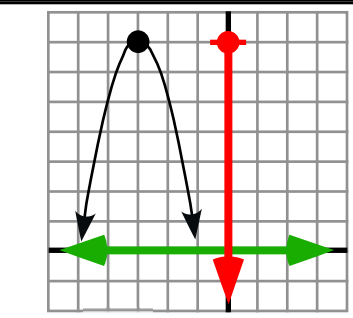
function? **yes** / no

x	-8	-5	-2	1	4
y	8	-1	-4	-1	8

D:  $\{-8, -5, -2, 1, 4\}$

R:  $\{-4, -1, 8\}$

function? **yes** / no



D:  $\mathbb{R}$

R:  $y \leq 7$

function? **yes** / no

$\{(-5,3), (-2,1), (1,4), (2,-6), (1,9)\}$

D:  $\{-5, -2, 1, 2\}$

R:  $\{-6, 1, 3, 4, 9\}$

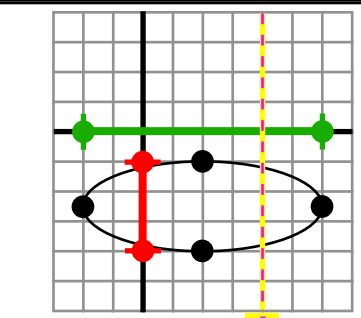
function? **yes** / **no**

x	0	3	4	5	5
y	0	-2	6	-3	11

D:  $\{0, 3, 4, 5\}$

R:  $\{-3, -2, 0, 6, 11\}$

function? **yes** / **no**

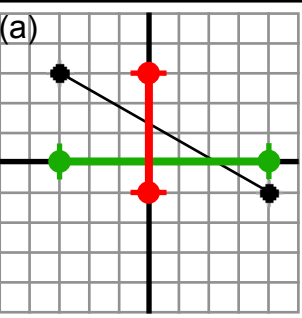


D:  $-2 \leq x \leq 6$

R:  $-4 \leq y \leq -1$

function? **yes** / **no**

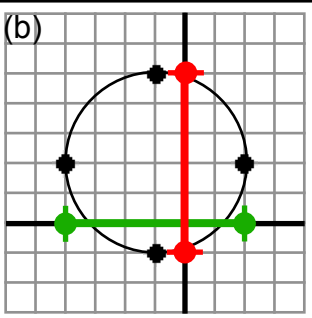
Find the domain and range for each relation. Then determine whether it's a function.



D:  $-3 \leq x \leq 4$

R:  $-1 \leq y \leq 3$

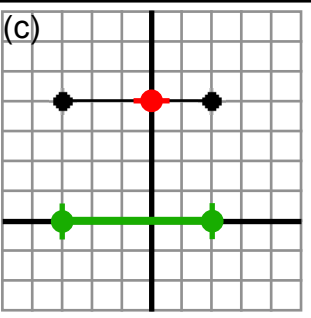
function? **yes** / no



D:  $-4 \leq x \leq 2$

R:  $-1 \leq y \leq 5$

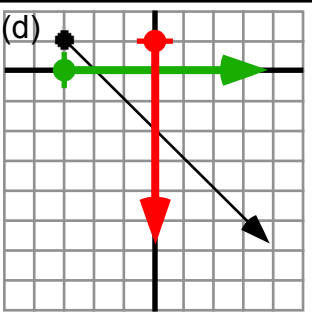
function? **yes** / **no**



D:  $-3 \leq x \leq 2$

R:  $y = 4$

function? **yes** / no



D:  $x \geq -3$

R:  $y \leq 1$

function? **yes** / no

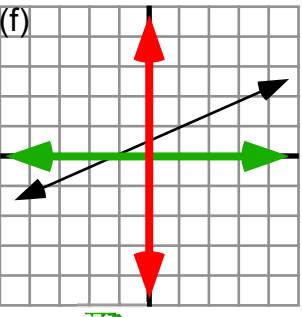
(e)

x	y
-2	0
8	4
1	-6
-2	9
5	3

D:  $\{-2, 1, 5, 8\}$

R:  $\{-6, 0, 3, 4, 9\}$

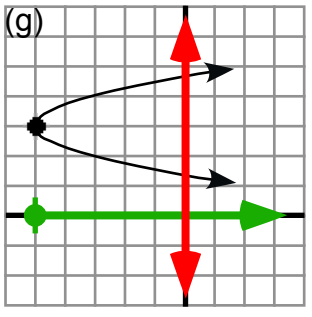
function? **yes** / **no**



D:  $\mathbb{R}$

R:  $\mathbb{R}$

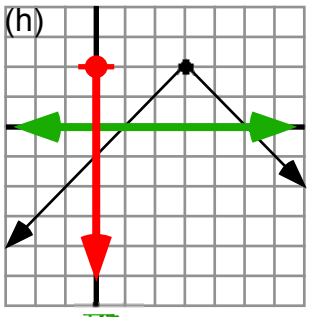
function? **yes** / no



D:  $x \geq -5$

R:  $\mathbb{R}$

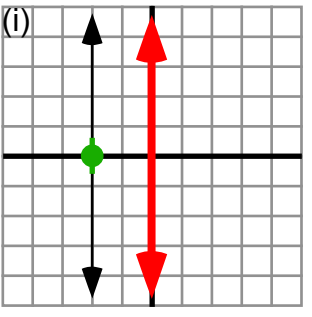
function? **yes** / **no**



D:  $\mathbb{R}$

R:  $y \leq 2$

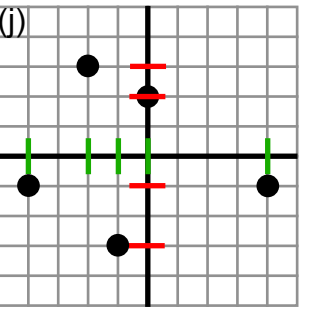
function? **yes** / no



D:  $x = -2$

R:  $\mathbb{R}$

function? **yes** / **no**



D:  $\{-4, -2, -1, 0, 4\}$

R:  $\{-3, -1, 2, 3\}$

function? **yes** / no