Section 2.3: Functions

Video 1

A **relation** is a set of ordered pairs.
A **function** is a relation in which, for each distinct value of the first component of the ordered pairs, there is *exactly one* value of the second component.
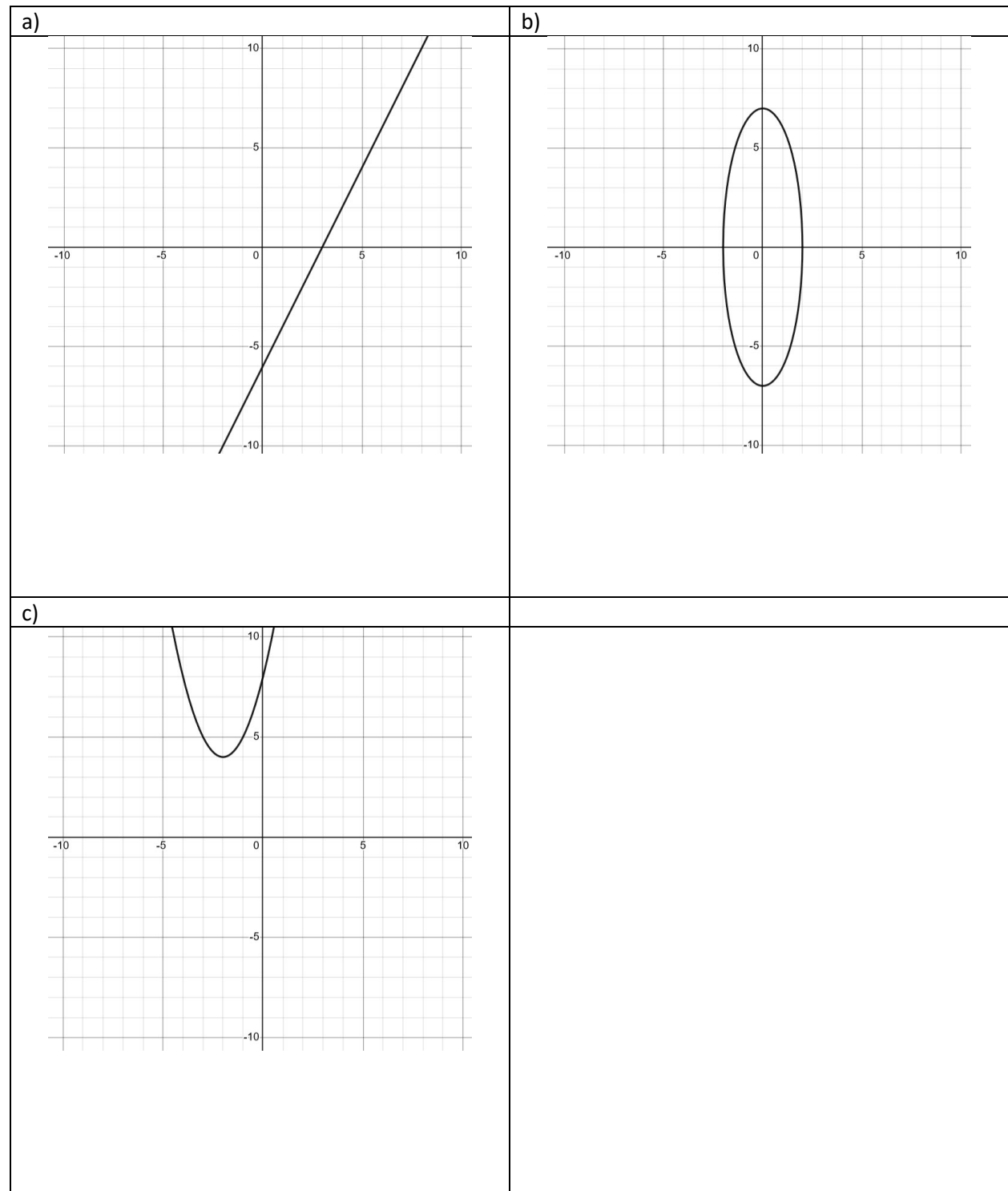
1) List the domain and range of each relation. Does the relation define a function?

a) $\{(-2,9),(3,2),(8,9)\}$
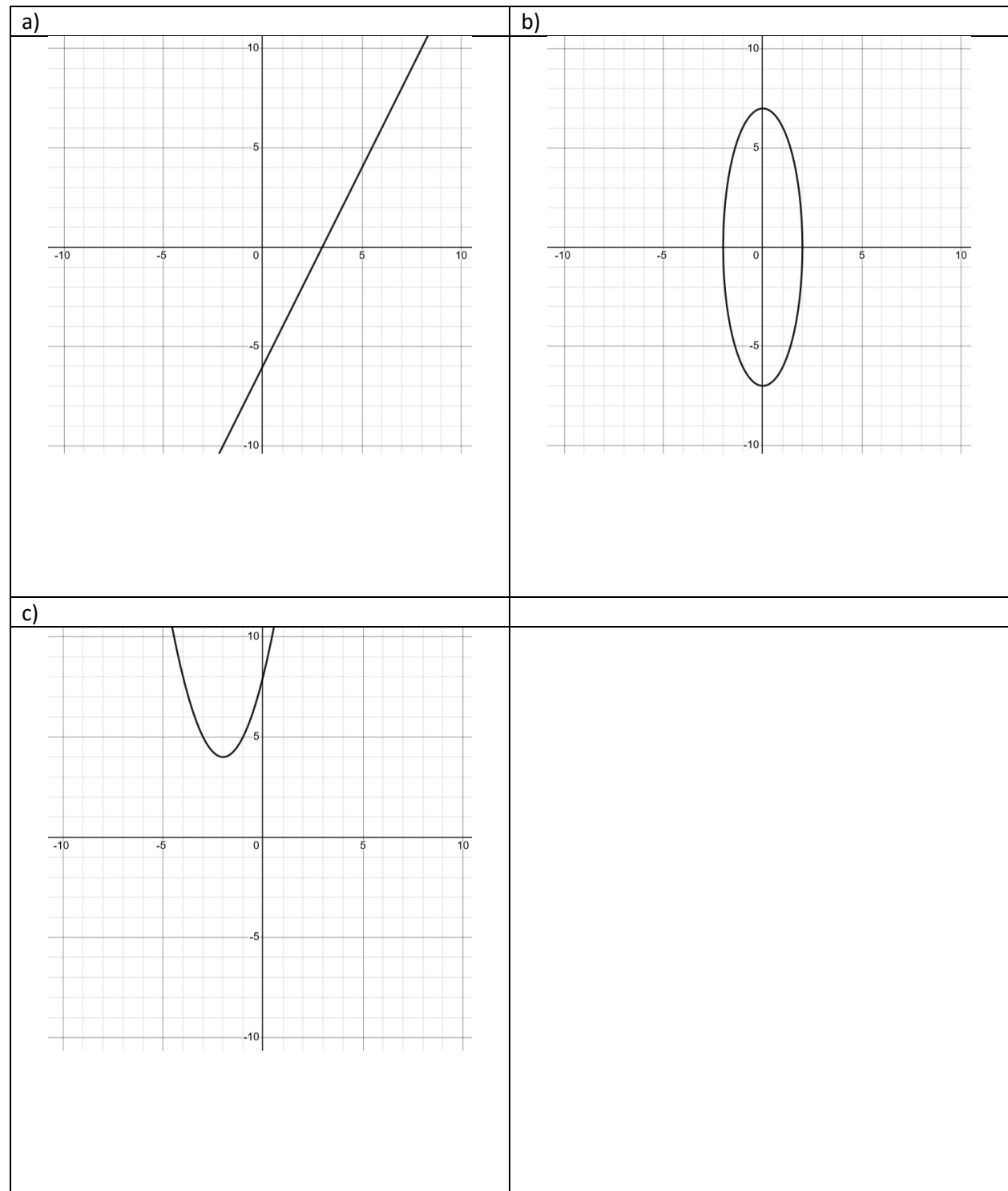
b) $\{(4,2),(1,1),(0,0),(1,-1)\}$

Video 2

2) Give the domain and range of the given relation.

a)	b)
c)	

Video 3

3) Use the Vertical Line Test to determine if the relation that is graphed is a function.

a)	b)
c)	

Video 4

4) Determine whether each relation defines y as a function of x, and give the domain and the range.

a) $y = 2x - 3$

b) $x = |y - 3|$

c) $y \geq 5x$

d) $y = \sqrt{x - 4}$

e) $y = \dfrac{3}{x + 6}$

Video 5

5) Let $f(x) = x^2 + 5x - 8$. Find the following.

a) $f(-3)$ b) $f(a)$

c) $f(n+5)$

Video 6

6) Assume *y* is a function *f* of *x*. Rewrite each equation as a function of *x*, and find $f(-6)$ and $f(3)$.

a) $3x + 4y = 20$

4) $y = x^2 - 6x - 10$

Video 7

On an open interval *I* containing the points x_1 and x_2,

- A function *f* is increasing if $f(x_1) < f(x_2)$ whenever $x_1 < x_2$.
- A function *f* is decreasing if $f(x_1) > f(x_2)$ whenever $x_1 < x_2$.
- A function *f* is constant if $f(x_1) = f(x_2)$ whenever $x_1 < x_2$.

7) For the given function, determine the intervals for which the function is increasing, decreasing =, and constant.