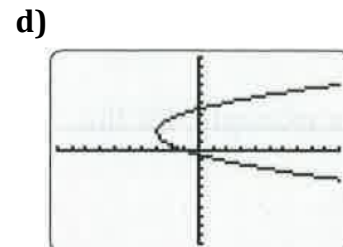
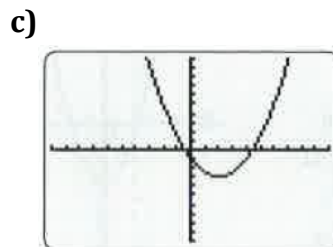
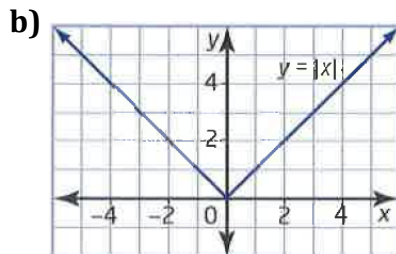
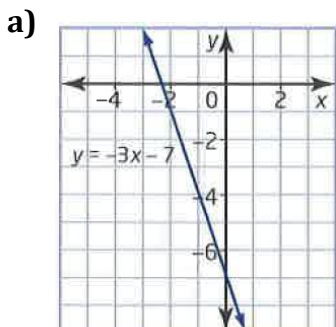


1.1 Functions, Domain, and Range - Worksheet

MCR3U

Jensen

1) Which graphs represent functions? Justify your answer.



2) Is each relation a function? Explain and make a rough sketch of the graph of each.

a) $y = x - 5$

b) $y = 2(x - 1)^2 - 2$

c) $x^2 + y^2 = 4$

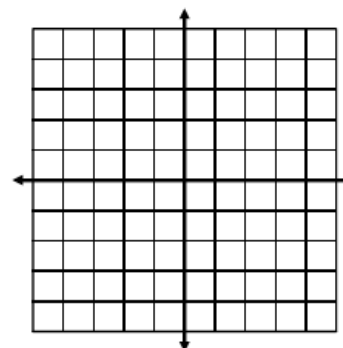
3) State the domain and range. Represent as a table and graph. Then state if it is a function.

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

Domain:

Range:

x	y



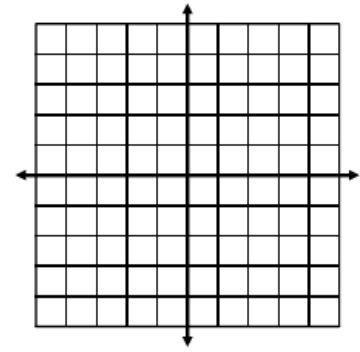
Is this relation a function?

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

Domain:

Range:

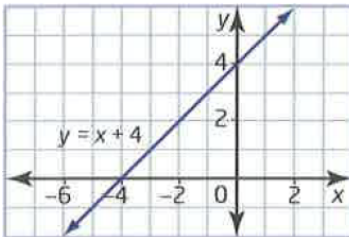
x	y



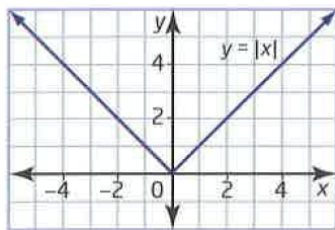
Is this relation a function?

4) State the domain and range of each relation. Then state if the relation is a function.

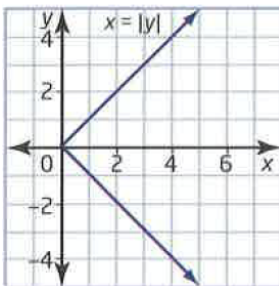
a)



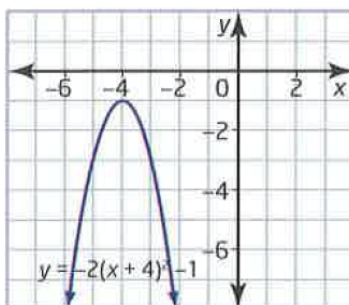
b)

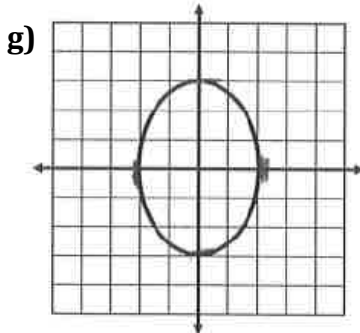
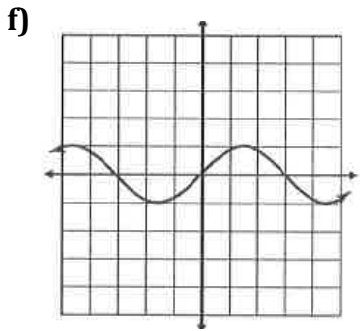
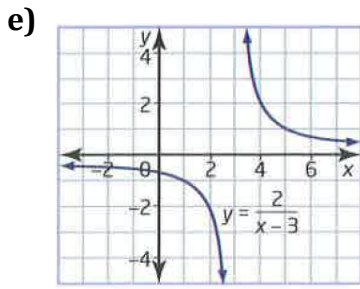


c)



d)

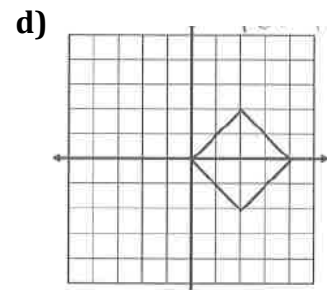
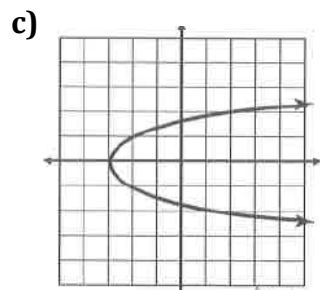
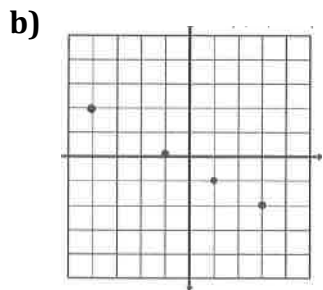




5) Which of the following relations are functions?

a)

x	y
2	-3
-1	0
5	5
3	2
2	1



6) Determine the domain and range of each of the following relations. Use a graphing calculator or a graphing app to help if necessary. Make a rough sketch of the graph.

a) $y = -x + 3$

b) $y = (x + 1)^2 - 4$

c) $y = -3x^2 + 1$

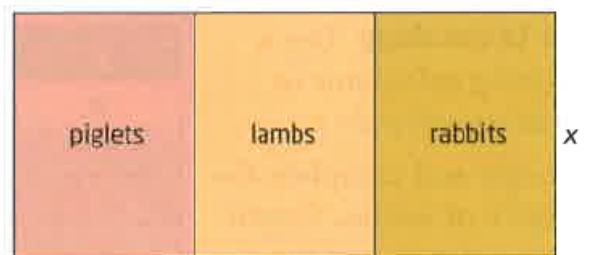
d) $x^2 + y^2 = 9$

e) $y = \frac{1}{x+3}$

f) $y = \sqrt{2x + 1}$

7) Pam has 90 m of fencing to enclose an area in a petting zoo with two dividers to separate three types of young animals. The three pens are to have the same area.

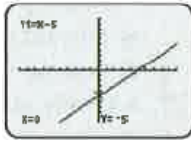
- a) Express the area function for the three pens in terms of x .
- b) Determine the domain and range for the area function.



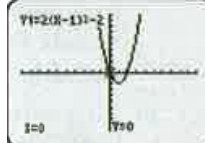
Answers

1) a, b, and c are functions. d is not a function.

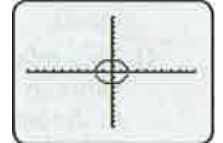
2) a) function



b) function

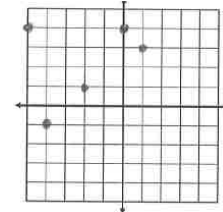


c) not a function



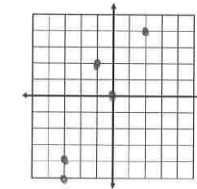
3) a) D: $\{x = -5, -4, -2, 0, 1\}$ R: $\{y = -1, 1, 3, 4\}$

x	y
-5	4
-4	-1
-2	1
0	4
1	3



b) D: $\{x = -3, -1, 0, 2\}$ R: $\{y = -4, 0, 2, 4, 5\}$

x	y
-3	-4
-1	2
0	0
-3	5
2	4



4) a) D: $\{X \in \mathbb{R}\}$

R: $\{Y \in \mathbb{R}\}$

this relation is a function

b) D: $\{X \in \mathbb{R}\}$

R: $\{Y \in \mathbb{R} | y \geq 0\}$

this relation is a function

c) D: $\{X \in \mathbb{R} | x \geq 0\}$

R: $\{Y \in \mathbb{R}\}$

this relation is NOT a function

d) D: $\{X \in \mathbb{R}\}$

R: $\{Y \in \mathbb{R} | y \leq -1\}$

this relation is a function

e) D: $\{X \in \mathbb{R} | x \neq 3\}$

R: $\{Y \in \mathbb{R} | y \neq 0\}$

this relation is a function

f) D: $\{X \in \mathbb{R}\}$

R: $\{Y \in \mathbb{R} | -1 \leq y \leq 1\}$

this relation is a function

g) D: $\{X \in \mathbb{R} | -2 \leq x \leq 2\}$

R: $\{Y \in \mathbb{R} | -3 \leq y \leq 3\}$

this relation is NOT a function

5) b is the only relation that is a function

6) a) domain $\{x \in \mathbb{R}\}$, range $\{y \in \mathbb{R}\}$

b) domain $\{x \in \mathbb{R}\}$, range $\{y \in \mathbb{R}, y \geq -4\}$

c) domain $\{x \in \mathbb{R}\}$, range $\{y \in \mathbb{R}, y \leq 1\}$

d) domain $\{x \in \mathbb{R}, -3 \leq x \leq 3\}$;
range $\{y \in \mathbb{R}, -3 \leq y \leq 3\}$

e) domain $\{x \in \mathbb{R}, x \neq -3\}$, range $\{y \in \mathbb{R}, y \neq 0\}$

f) domain $\{x \in \mathbb{R}, x \geq -0.5\}$, range $\{y \in \mathbb{R}, y \geq 0\}$

7) a) $A = -2x^2 + 45x$ b) D: $\{X \in \mathbb{R} | 0 < x < 22.5\}$ R: $\{Y \in \mathbb{R} | 0 < y \leq 253.1\}$