

Characteristics of Relations and Functions (pp. 4 of 6)

3. Function notation

Functional notation is a method used to represent the point (x, y) as $(x, f(x))$. Other letters besides "f" may be used in order to identify multiple functions by different letters.

- If $f(x) = 2x + 3$, find $f(4)$ and $f(-1)$.

$f(4) = 2(4) + 3$

$f(-1) = 2(-1) + 3$

$f(4) = 8 + 3 = 11$

$f(-1) = -2 + 3 = 1$

So the ordered pair $(4, 11)$ is included in the function $f(x)$.

So the ordered pair $(-1, 1)$ is included in the function $f(x)$.

- A) Given that $g(x) = x^2 + 2$ and $h(x) = 4x + 10$, evaluate the following.

$h(3) = 4(3) + 10$
 $= 12 + 10$
 $= 22$

$g(-3) = (-3)^2 + 2$
 $= 9 + 2$
 $= 11$

$g(a+1) = (a+1)^2 + 2$
 $= (a+1)(a+1) + 2$
 $= a^2 + a + a + 1 + 2 = a^2 + 2a + 3$

- B) In function notation, $(x, f(x))$, which symbols represent the domain and range?

- C) What are the benefits of using function notation?

you can work with multiple functions at the same time

4. Label the axes, the origin, and the quadrants of the coordinate plane below, and then graph the points in the set.

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

- A) Identify the domain.

$D: \{-2, 3, -3, 0, 1, 4\}$

- B) Identify the range.

$D: \{5, 4, -5, 0, -2\}$

- C) Is the relation a function?

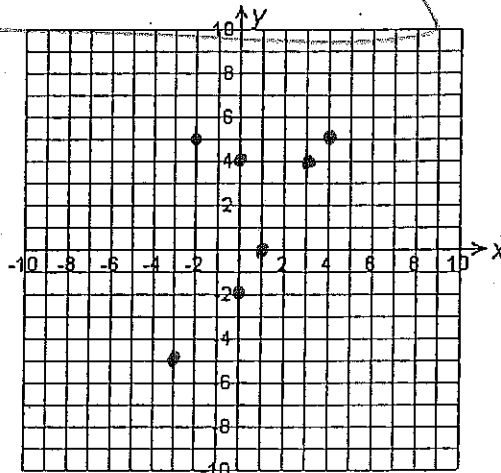
Explain your reasoning.

No, x repeat

- D) Is it continuous or discrete?

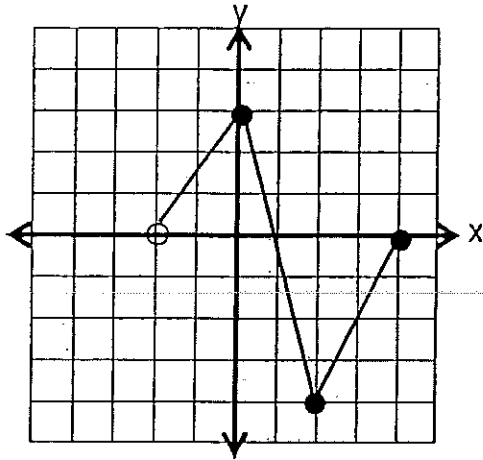
Explain your reasoning.

discrete

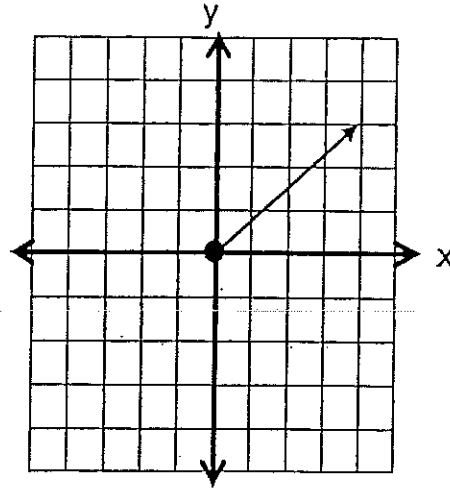


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5. Provide information about the relations graphed below.



- Identify the domain.
 $(-2, 4]$
- Identify the range.
 $[-4, 3]$
- Is the relation also a function?
 yes
- Is it continuous or discrete?
 continuous
- On what interval(s) is it increasing?
 $(-2, 0) \cup (2, 4)$
- On what interval(s) is it decreasing?
 $(0, 2)$



- Identify the domain.
 $[0, \infty)$
- Identify the range.
 $[0, \infty)$
- Is the relation also a function?
 yes
- Is it continuous or discrete?
 continuous
- On what interval(s) is it increasing?
 $(0, \infty)$
- On what interval(s) is it decreasing?
 none

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6. Provide information about the equations given below.

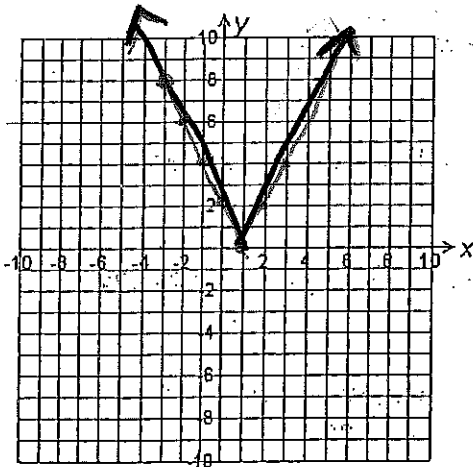
$$y = 2|x - 1|$$

- Complete the table of values.

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

2|-3-1|

- Sketch the graph.



- Identify the domain and range.

$D: (-\infty, \infty)$
 $R: [0, \infty)$

- Is the relation also a function?

yes, passes vert. line test

- Is it continuous or discrete?

- What parent function best represents the data?

$$f(x) = |x|$$

absolute value function

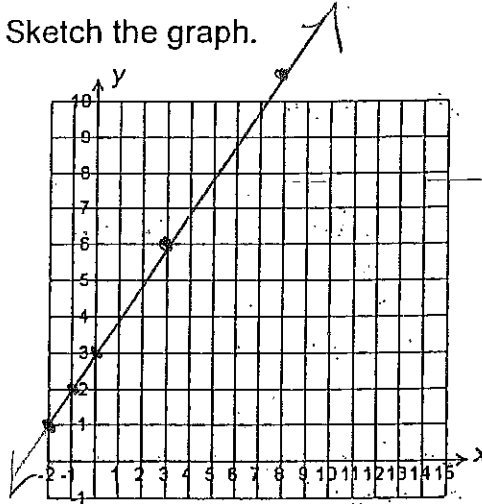
$$y = x + 3$$

- Complete the table of values.

x	y
-2	1
-1	2
0	3
3	6
8	11
15	18

x+3

- Sketch the graph.



- Identify the domain and range.

$D: \text{all } \mathbb{R}$
 $R: \text{all } \mathbb{R}$

- Is the relation also a function?

yes

- Is it continuous or discrete?

- What parent function best represents the data?

$$f(x) = x$$

