

DO NOW

A function is represented by $f(x) = x^2 - 3x + 5$.

Find $f(-3)$. $x = -3$

$$f(-3) = (-3)^2 - 3(-3) + 5$$

$$f(-3) = 9 + 9 + 5$$

$$f(-3) = 23$$

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INTRODUCTION TO FUNCTIONS

| | | | | | |
|----------|----|---|---|---|---|
| x | 0 | 1 | 2 | 3 | 4 |
| y = f(x) | -2 | 0 | 2 | 4 | 6 |

Domain: set of all the first elements of the ordered pairs (x), the "input"

$$\text{Domain} = \{0, 1, 2, 3, 4\}$$

Range: set of all the second elements of the ordered pairs (f(x)), the "output"

$$\text{Range} = \{-2, 0, 2, 4, 6\}$$

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Relation: a set of ordered pairs (x, y)

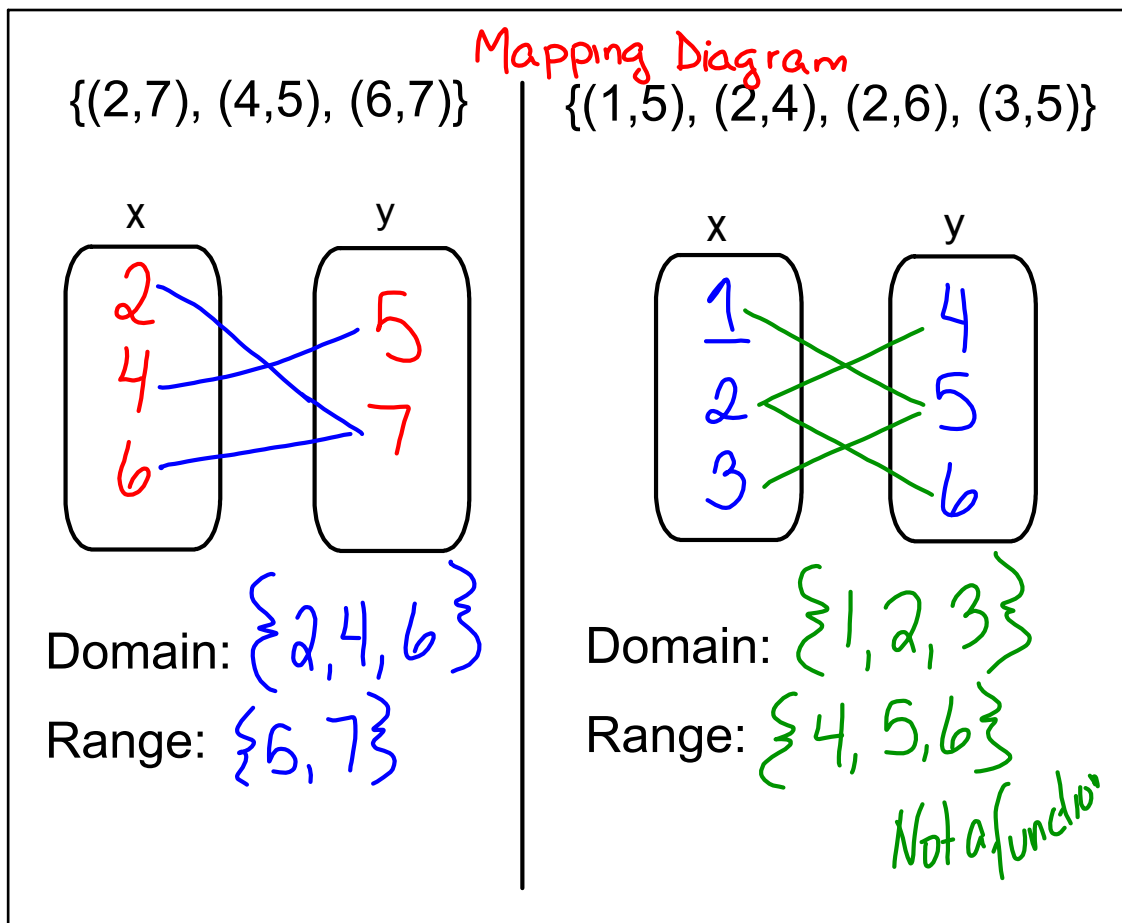
EX: $\{(1,2), (2,3), (3,4), (4,5)\}$

Function: a relation where every element of the domain is paired with one and only one element of the range

Each *input* has EXACTLY one *output*

If the elements of the relation have repeated "x" values, it is NOT a function

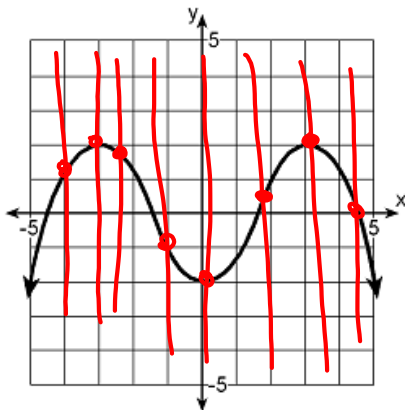
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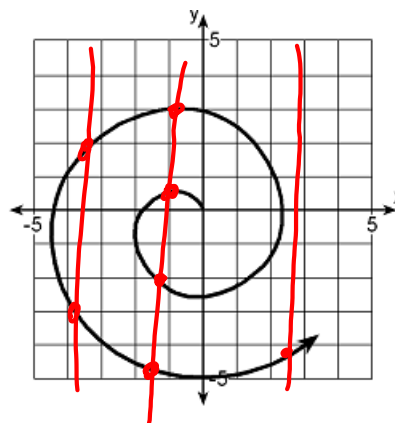
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Vertical Line Test: If a vertical line passes through the graph MORE THAN ONCE, then the relation is NOT a function.

Function



Not a Function

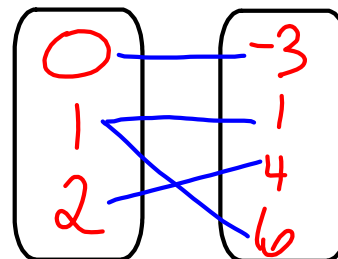
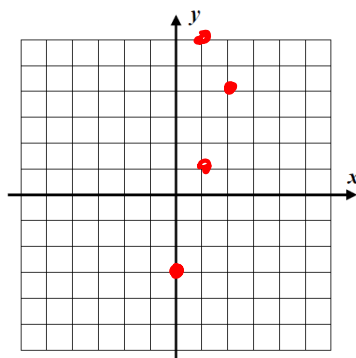


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Express the given relation as a table, as a graph, and as a mapping diagram. Tell whether the relation is a function.

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

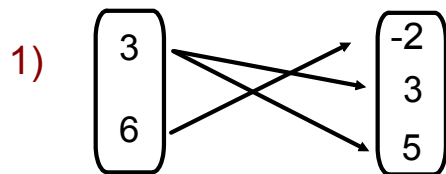
| x | y |
|---|----|
| 0 | -3 |
| 1 | 1 |
| 2 | 4 |
| 1 | 6 |



Not a function
Repeating x-value

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Tell whether the relation is a function. State the domain and range.



$D: \{3, 6\}$
 $R: \{-2, 3, 5\}$
 No

2) $(1, 10), (2, 10), (3, 10), (4, 10), (5, 10)$

$D: \{1, 2, 3, 4, 5\}$ $R: \{10\}$ Yes

3)

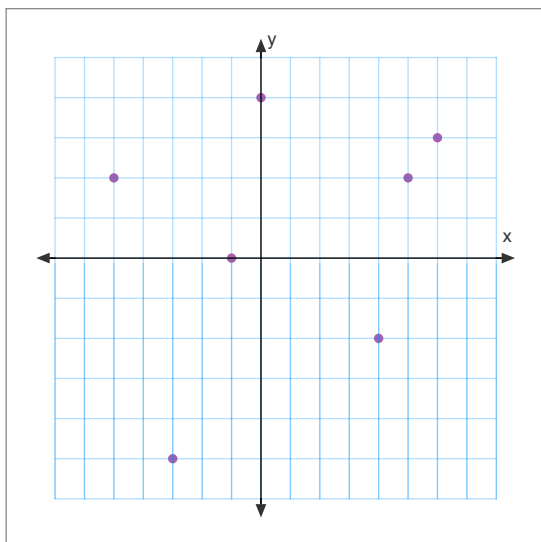
| x | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
| f(x) | 2 | 3 | 2 | 3 | 2 |

$D: \{1, 2, 3, 4, 5\}$
 $R: \{2, 3\}$
Yes

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For the graph of the relation below:

- a) State the domain. $D = \{-5, -3, -1, 0, 4, 5, 6\}$
 b) State the range. $R = \{-5, -2, 0, 2, 3, 4\}$
 c) State whether or not the relation is a function.



Yes

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