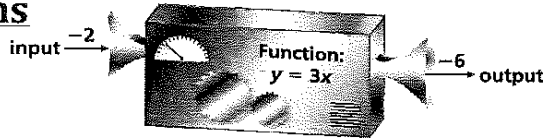


Section 3.1: Functions



Relation: any set of ordered pairs

Function: a relation in which each input has exactly one output

Domain: the set of all possible input values

Range: the set of all possible output values

Independent variable: the variable that represents the input value of a function

Dependent variable: the variable that represents the output value of a function

Determine whether the relation is a function. Explain.

<p>1.</p> <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Input, x</td> <td style="padding: 5px;">-2</td> <td style="padding: 5px;">0</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">-2</td> </tr> <tr> <td style="padding: 5px;">Output, y</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">4</td> <td style="padding: 5px;">5</td> </tr> </table> <p style="margin-left: 20px;">No, "-2" has more than 1 output</p>	Input, x	-2	0	1	-2	Output, y	4	5	4	5	<table border="1" style="display: inline-table; border-collapse: collapse; margin-right: 20px;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">y</td> </tr> <tr> <td style="padding: 5px;">-2</td> <td style="padding: 5px;">4</td> </tr> <tr> <td style="padding: 5px;">-2</td> <td style="padding: 5px;">5</td> </tr> <tr> <td style="padding: 5px;">0</td> <td style="padding: 5px;">5</td> </tr> <tr> <td style="padding: 5px;">1</td> <td style="padding: 5px;">4</td> </tr> </table> <p>2. (0, 3), (1, 1), (2, 1), (3, 0)</p> <table border="1" style="display: inline-table; border-collapse: collapse; margin-right: 20px;"> <tr> <td style="padding: 5px;">x</td> <td style="padding: 5px;">y</td> </tr> <tr> <td style="padding: 5px;">0</td> <td style="padding: 5px;">3</td> </tr> <tr> <td style="padding: 5px;">1</td> <td style="padding: 5px;">1</td> </tr> <tr> <td style="padding: 5px;">2</td> <td style="padding: 5px;">1</td> </tr> <tr> <td style="padding: 5px;">3</td> <td style="padding: 5px;">0</td> </tr> </table> <p>yes, each input has exactly one output</p>	x	y	-2	4	-2	5	0	5	1	4	x	y	0	3	1	1	2	1	3	0
Input, x	-2	0	1	-2																											
Output, y	4	5	4	5																											
x	y																														
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1	4																														
x	y																														
0	3																														
1	1																														
2	1																														
3	0																														

Vertical Line Test

A graph represent a function when *no vertical line* passes through more than one point on the graph.

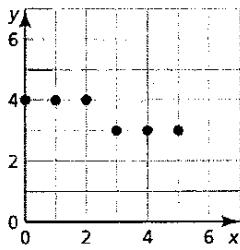
Function 	Not a function
---------------------	---------------------------

Determine whether the graph represents a function. Explain.

<p>3.</p> <p style="margin-left: 20px;">No, doesn't pass the VLT vertical line test</p>	<p>4.</p> <p style="margin-left: 20px;">Yes, passes the VLT</p>
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Find the domain and range of the function represented by the graph.

5.

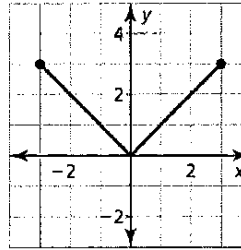


x	y
0	4
1	4
2	4
3	3
4	3
5	3

$$D = \{x \mid x = 0, 1, 2, 3, 4, 5\}$$

$$R = \{y \mid y = 3, 4\}$$

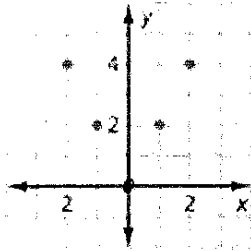
6.



$$D = \{x \mid -3 \leq x \leq 3\}$$

$$R = \{y \mid 0 \leq y \leq 3\}$$

7.

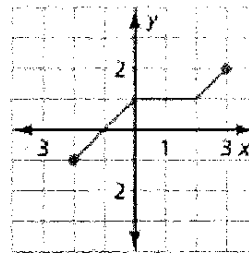


x	y
-2	4
-1	2
0	0
1	2
2	4

$$D = \{x \mid x = -2, -1, 0, 1, 2\}$$

$$R = \{y \mid y = 0, 2, 4\}$$

8.



$$D = \{x \mid -2 \leq x \leq 3\}$$

$$R = \{y \mid -1 \leq y \leq 2\}$$

9. The equation $y = 12x$ represents the number y of pages of text a computer printer can print in x minutes.

a. Identify the independent and dependent variables.

x
(minutes)

y
(pages)

b. The domain is 1, 2, 3, and 4. What is the range?

x	$12x$	y
1	$12(1)$	12
2	$12(2)$	24
3	$12(3)$	36
4	$12(4)$	48

$$R = \{y \mid y = 12, 24, 36, 48\}$$