



## Functions (page 1)

A relation is a **function** if for each input there is exactly one output. In other words, the *output* is a *function* of the *input*. When a relation is shown by graph, you can use the vertical line test to tell whether the relation is a function. The **vertical line test** states that if you can find a vertical line that passes through more than one point of the graph, then the relation is NOT a function.

*Examples:* Tell whether the relation is a function.

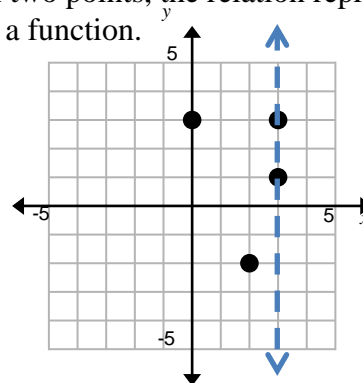
(A)  $\{(2, 5), (3, 2), (3, 1), (4, 4)\}$

zNOT a function since the input 3 is paired with two outputs, 1 and 2.

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

IS a function since every input is paired with exactly one output

(C) Since the vertical line shown passes through two points, the relation represented is NOT a function.



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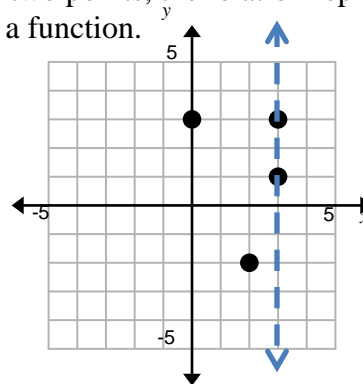
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## Functions (page 2)

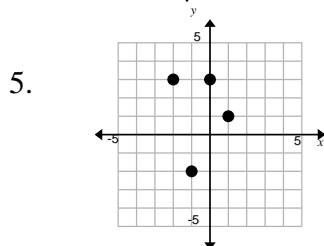
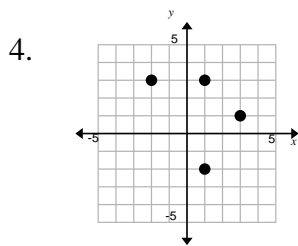
Tell whether the relation is a function. Explain your reasoning.

1.  $\{(1, -4), (2, -4), (3, 5), (4, 6)\}$

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

3.

|     |    |    |    |    |
|-----|----|----|----|----|
| $x$ | -1 | 0  | 1  | 2  |
| $y$ | -1 | -1 | -1 | -1 |



## Functions (page 2)

Tell whether the relation is a function. Explain your reasoning.

6.  $\{(1, -4), (2, -4), (3, 5), (4, 6)\}$

7.  $\{(4, -2), (-1, -2), (4, 3), (1, 3)\}$

8.

|     |    |    |    |    |
|-----|----|----|----|----|
| $x$ | -1 | 0  | 1  | 2  |
| $y$ | -1 | -1 | -1 | -1 |

