

## 3C Relations and Functions

Mila and Greg are playing a guessing game. Mila tells Greg a number, and Greg changes it into another number according to a rule that only he knows. To win, Mila has to guess Greg's rule.

1. The table shows Mila's numbers and Greg's responses. What rule is Greg using to change the numbers?
2. A *function* is a rule that assigns one and only one output value to each input value. If Mila's numbers are the inputs, is Greg's rule a function? Explain.

Mila	Greg
1	2
3	6
4	8
10	20
20	40

3. During another game, Mila said "2" twice, but Greg gave different answers each time. Is he still using a function as a rule? Explain.
4. A *relation* is a rule that pairs numbers in one set with number in another set. Unlike a function, an input in a relation can have more than one output. In the game shown at right, is Greg using a function or a relation?

Mila	Greg
1	4
2	3
1	5
3	6

### Think and Discuss

5. **Discuss** why the guessing game does not work if Greg is using a relation, not a function.

LESSON

# Review for Mastery

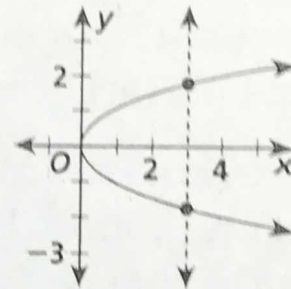
## 30 Functions (continued)

A function has exactly one output for each input. You can check to see if a relation is a function by making sure each value in the domain is associated with only one value in the range. You can use the vertical line test on a graph.

Determine if the relation is a function. Explain.

$x$	$y$
1	10
2	20
3	30
4	40
5	50

The relation is a function.  
Each  $x$  value has only one  $y$  value.



The relation is not a function.  
A vertical line intersects the graph at two points.

Determine if the relation is a function. Explain.

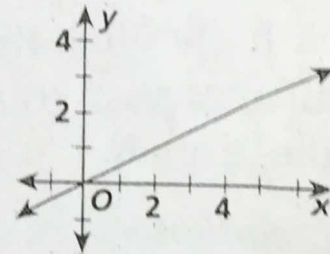
1.

$x$	$y$
-2	5
-1	7
0	9
-1	6
-2	4

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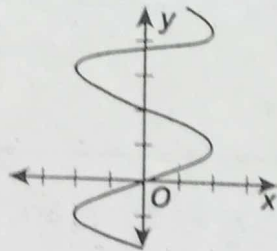
2.



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3.



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4.

$x$	$y$
1	1
2	1
3	1
4	1
5	1

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