

Lesson 5-2

Relations and Functions

<p>Lesson Objectives</p> <p>1 Identify relations and functions</p> <p>2 Evaluate functions</p>	<p>NAEP 2005 Strand: Algebra</p> <p>Topic: Patterns, Relations, and Functions</p> <p>Local Standards: _____</p>
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Vocabulary

A _____ is a relation that assigns exactly one value in the range to each value in the domain.

A relation is _____

The _____ of a relation is the set of first coordinates of the ordered pairs.

The range of a relation is _____

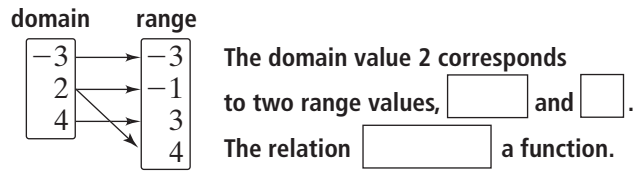
The _____ says that, on the graph of a relation, if any vertical line passes through more than one point on the graph, the relation is not a function.

A function rule is _____

_____ is a way to write a function using x to represent the inputs and $f(x)$ to represent the outputs.

Example

1 Using a Mapping Diagram Determine whether the relation $\{(4, 3), (2, -1), (-3, -3), (2, 4)\}$ is a function.



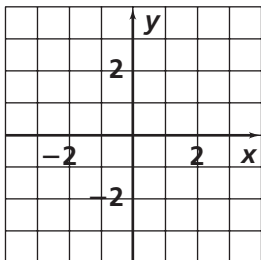
Quick Check

1. Use a mapping diagram to determine whether each relation is a function.
- a. $\{(3, -2), (8, 1), (9, 2), (3, 3), (-4, 0)\}$ b. $\{(6.5, 0), (7, -1), (6, 2), (2, 6), (5, -1)\}$

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Examples

- 2 Using the Vertical-Line Test** Determine whether the relation $\{(0, -2), (1, -2), (-3, 1), (-2, 0), (-1, -1), (3, 2), (2, -3)\}$ is a function.



Graph the ordered pairs on a coordinate plane

vertical line passes through more than one point.
The relation a function.

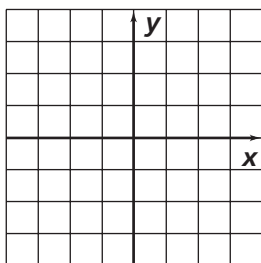
- 3 Finding the Range** Evaluate the function rule $f(g) = -2g + 4$ to find the range for the domain $\{-1, 3, 5\}$.

$f(g) = -2g + 4$	$f(g) = -2g + 4$	$f(g) = -2g + 4$
$f(\text{ }) = -2(\text{ }) + 4$	$f(\text{ }) = -2(\text{ }) + 4$	$f(\text{ }) = -2(\text{ }) + 4$
$f(\text{ }) = \text{ } + 4$	$f(\text{ }) = \text{ } + 4$	$f(\text{ }) = \text{ } + 4$
$f(\text{ }) = \text{ }$	$f(\text{ }) = \text{ }$	$f(\text{ }) = \text{ }$

The range is $\{\text{ }\}$.

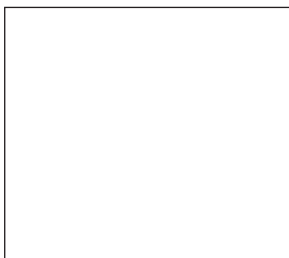
Quick Check

2. Use the vertical-line test to determine whether the relation $\{(0, 2), (1, -1), (-1, 4), (0, -3), (2, 1)\}$ is a function.



3. Find the range of each function for the domain $\{-2, 0, 5\}$.

a. $f(x) = x - 6$



b. $y = -4x$



c. $g(t) = t^2 + 1$

