## More on Relations

## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$

## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$
Definition: The domain of a relation is the set of $x$-values

## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$
Definition: The domain of a relation is the set of $x$-values
Definition: The range of a relation is the set of $y$-values

## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$
Definition: The domain of a relation is the set of $x$-values
Definition: The range of a relation is the set of $y$-values
Definition: A function is a relation so that no two pairs have the same $x$-value. That is, no $x$-value shows up twice.

## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$
Definition: The domain of a relation is the set of $x$-values
Definition: The range of a relation is the set of $y$-values
Definition: A function is a relation so that no two pairs have the same $x$-value. That is, no $x$-value shows up twice.
Example 1: $\{(-3,2),(-1,2),(1,3),(2,-2)\}$

## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$
Definition: The domain of a relation is the set of $x$-values
Definition: The range of a relation is the set of $y$-values
Definition: A function is a relation so that no two pairs have the same $x$-value. That is, no $x$-value shows up twice.
Example 1: $\{(-3,2),(-1,2),(1,3),(2,-2)\}$


## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$
Definition: The domain of a relation is the set of $x$-values Definition: The range of a relation is the set of $y$-values
Definition: A function is a relation so that no two pairs have the same $x$-value. That is, no $x$-value shows up twice.
Example 1: $\{(-\mathbf{3}, 2),(-\mathbf{1}, 2),(\mathbf{1}, 3),(\mathbf{2},-2)\}$


Domain $=\{-3,-1,1,2\}$

## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$
Definition: The domain of a relation is the set of $x$-values Definition: The range of a relation is the set of $y$-values
Definition: A function is a relation so that no two pairs have the same $x$-value. That is, no $x$-value shows up twice.
Example 1: $\{(-3, \mathbf{2}),(-1, \mathbf{2}),(1, \mathbf{3}),(2,-\mathbf{2})\}$


Domain $=\{-3,-1,1,2\}$
Range $=\{-2,2,3\}$

## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$
Definition: The domain of a relation is the set of $x$-values
Definition: The range of a relation is the set of $y$-values
Definition: A function is a relation so that no two pairs have the same $x$-value. That is, no $x$-value shows up twice.
Example 1: $\{(-3,2),(-1,2),(1,3),(2,-2)\}$


Domain $=\{-3,-1,1,2\}$
Range $=\{-2,2,3\}$
This relation is a function.

## More on Relations

Definition: A relation is a set of ordered pairs $(x, y)$
Definition: The domain of a relation is the set of $x$-values
Definition: The range of a relation is the set of $y$-values
Definition: A function is a relation so that no two pairs have the same $x$-value. That is, no $x$-value shows up twice.
Example 1: $\{(-3,2),(-1,2),(1,3),(2,-2)\}$


Domain $=\{-3,-1,1,2\}$
Range $=\{-2,2,3\}$
This relation is a function.
Note: A relation can still be a function with a repeated $y$-value

