Slide 1

5.2 Properties of Functions

Lesson 3

Slide 2

Connect   Definitions:

DOMAIN - The set of first elements of a relation
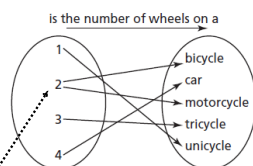
RANGE - the set of related 2nd elements of a relation

FUNCTION- is a special type of relation where each element in the domain is associated with exactly one element in the range.

Slide 3

Connect   This is a **NOT** FUNCTION

Here are some different ways to relate vehicles and number of wheels each has.

This relation associates a number with a vehicle with that number of wheels.

is the number of wheels on a

1
2 → bicycle
   → car
3 → motorcycle
   → tricycle
4 → unicycle

This is not a function because there is 1 element in set 1 that associates with 2 elements in set 2.

Domain: (1,2,3,4)

Range: (unicycle, bicycle, motorcycle, tricycle, car)

Slide 4

Connect   This is a **NOT** FUNCTION

Here are some different ways to relate vehicles and number of wheels each has.

This relation associates a number with a vehicle with that number of wheels.

Ordered Pairs
(1, Unicycle)
(2, Bicycle)
(2, Motorcycle)
(3, Tricycle)
(4, Car)

This is not a function because 2 ordered pairs have the same first element.

This is a **FUNCTION**

Here are some different ways to relate vehicles and number of wheels each has.

This relation associates a a vehicle with the number of wheels it has

has this number of wheels

bicycle
car
motorcycle
tricycle
unicycle

1
2
3
4

This is a function because each element in set 1 associates exactly 1 element in set 2.

Domain: (unicycle, bicycle, motorcycle, tricycle, car)

Range: (1,2,3,4)

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This is a **NOT** FUNCTION

Here are some different ways to relate vehicles and number of wheels each has.

Ordered Pairs

(Bicycle, 2)
(Car, 2)
(Motorcycle, 2)
(Trycycle, 3)
(Unicycle, 1)

This relation associates a number with a vehicle with that number of wheels.

This is a function because ordered pairs have a different first element.

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EXAMPLE 1

For each relation:

a) Determine whether the relation is a function.

b) Identify the domain and range of each relation that is a function.

A relation that associates given shapes with the number of right angles in the shape.

Ordered Pairs

(right triangle, 1)
(acute triangle, 0)
(square, 4)
(rectangle, 4)
(regular hexagon, 0)

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EXAMPLE 1

Solution:

Ordered Pairs

(right triangle, 1)
(acute triangle, 0)
(square, 4)
(rectangle, 4)
(regular hexagon, 0)

Function ← NO therefore

STEPS:

Do any of the ordered pairs have the same first element?

Name the domain

Name the range

Domain { right triangle, acute triangle, square, rectangle regular hexagon }

Range { 0, 1, 4 }

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EXAMPLE 2

For each relation:

a) Determine whether the relation is a function.

b) Identify the domain and range of each relation that is a function.

Not a factor   is the square of   Doma:

(diagram: set {1, 4, 9} mapping to {-3, -2, -1, 1, 2})

EXAMPLE 2:

Solution: Not a Function.

is the square of

(diagram: set {1, 4, 9} mapping to {-3, -2, -1, 1, 2})

Domain: $\{1, 4, 9\}$

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

STEPS:

Does any element in set 1 associate with more than 1 element in set two?

Name the domain

Name the range

YOU TRY!

For each relation:

a) Determine whether the relation is a function.

b) Identify the domain and range of each relation that is a function.

Function:

A relation that associates a number with a prime factor of the number   Not a function

(4, 2), (6, 2), (6, 3), (8, 2), (9, 3)

Domain $\{4, 6, 8, 9\}$
Range $\{2, 3\}$ n

has this number of days

(diagram: January, February, March, April mapping to 28, 30, 31)

Domain: $\{$ Jan, Feb, March, April $\}$
Range: $\{28, 30, 31\}$

HOMEWORK!

Textbook Questions:

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