RELATIONS AND FUNCTIONS

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RELATION: Is any subset of the Cartesian Plane $\mathbb{R}X\mathbb{R}$

FUNCTION: Is a correspondence between the elements of two sets that associates with each element of the first set (domain) a unique element of the second set (range). Set of ordered pairs (x,y) such that no two distinct pairs have the same first element.

DOMAIN (*D*): The **domain** of a relation is the set composed of all the first elements of the ordered pairs .

RANGE (*R*): The **range** of a relation is the set composed of all the second elements of the ordered pairs.

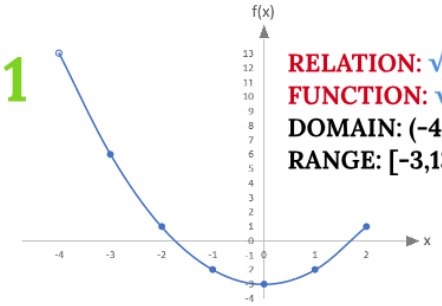
FUNCTIONS NOTATION: A function can be represented with letters "$f, g \circ h$". A function can be represented as:

$$F = \{(x, y) \mid f(x) = y, x \in \mathbb{R}\}$$

Where: **(x,y)** are the ordered pairs, **f(x)=y** is the equation named rule of correspondence , and the domain.

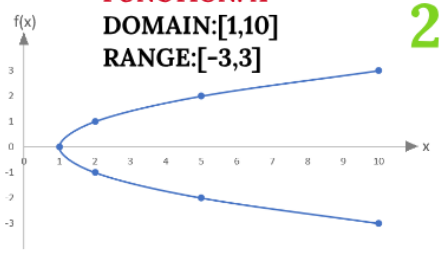
EXAMPLE: Determine if the following graphs are functions and/or relations. Obtain the domain and range.

1



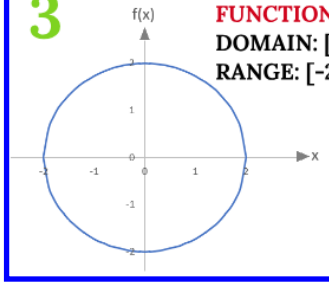
RELATION: √
FUNCTION: √
DOMAIN: (-4,2]
RANGE: [-3,13)

2



RELATION: √
FUNCTION: X
DOMAIN:[1,10]
RANGE:[-3,3]

3

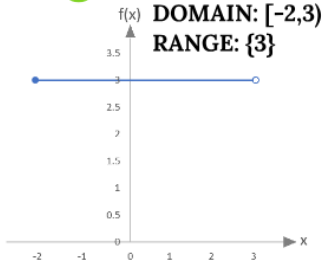


RELATION: √
FUNCTION: X
DOMAIN: [-2,2]
RANGE: [-2,2]

4

RELATION: √
FUNCTION: √
DOMAIN: (0,2π)
RANGE: [-1,1]

5



RELATION: √
FUNCTION: √
DOMAIN: [-2,3)
RANGE: {3}

EXAMPLE: Determine if the following relation is a function:

1) RELATION 1: { (1,2) , (2,3) , (3,4) }

RELATION ✓ FUNCTION ✓

2) RELATION 2: { (-2,2) , (-2,3) , (1,4) }

RELATION ✓ FUNCTION ✗

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