

# Student Observation Sheet: Domain and Range using GeoGebra

Learning Objective: Use GeoGebra to observe graphs and infer the domain and range of functions.

## Function: $f(x) = x$

Observation Question: What is the shape of the graph? Does it extend infinitely in all directions?

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

## Function: $f(x) = c$

Observation Question: Is the graph horizontal? Does y change when x changes?

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

## Function: $f(x) = x^2$

Observation Question: What is the minimum value of y? Does the graph go below it?

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

## Function: $f(x) = x^3$

Observation Question: Does the graph extend infinitely up and down?

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

## Function: $f(x) = 1/x$

Observation Question: Is the graph defined at  $x = 0$ ? What happens near  $x = 0$ ?

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

## Function: $f(x) = |x|$

Observation Question: Are any y-values negative? Where is the lowest point?

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

## Function: $f(x) = \text{sgn}(x)$

Observation Question: What values does the function take for  $x < 0$ ,  $x = 0$ ,  $x > 0$ ?

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

## Function: $f(x) = \text{floor}(x)$

Observation Question: Does the graph form steps? Are y-values integers only?

Domain: \_\_\_\_\_ Range: \_\_\_\_\_

## Answer Key

$f(x) = x$ : Domain:  $\mathbb{R}$ , Range:  $\mathbb{R}$

$f(x) = c$ : Domain:  $\mathbb{R}$ , Range:  $\{c\}$

$f(x) = x^2$ : Domain:  $\mathbb{R}$ , Range:  $y \geq 0$

$f(x) = x^3$ : Domain:  $\mathbb{R}$ , Range:  $\mathbb{R}$

$f(x) = 1/x$ : Domain:  $\mathbb{R} - \{0\}$ , Range:  $\mathbb{R} - \{0\}$

$f(x) = |x|$ : Domain:  $\mathbb{R}$ , Range:  $y \geq 0$

$f(x) = \text{sgn}(x)$ : Domain:  $\mathbb{R}$ , Range:  $\{-1, 0, 1\}$

$f(x) = \text{floor}(x)$ : Domain:  $\mathbb{R}$ , Range:  $\mathbb{Z}$

## GeoGebra Observation Checklist Rubric

- Correctly plots the function in GeoGebra
- Identifies breaks, gaps, or asymptotes
- Uses graph behavior to infer domain
- Uses graph behavior to infer range
- Writes domain and range using correct notation
- Works independently and records observations