

# Domain and Range

## Summary

1. Domain: all possible input; Range: all possible output.

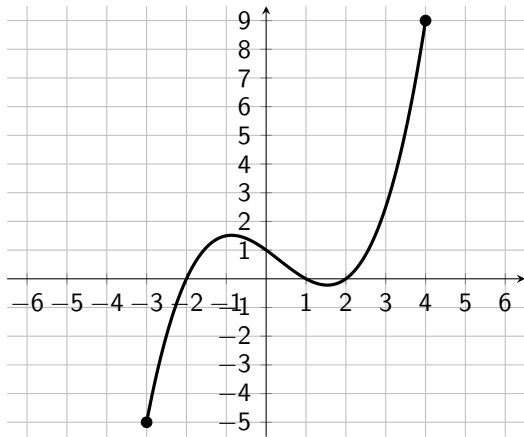
## Domain (Visual)

The **domain** of a function is the set of all possible inputs (usually  $x$ ) of the function.

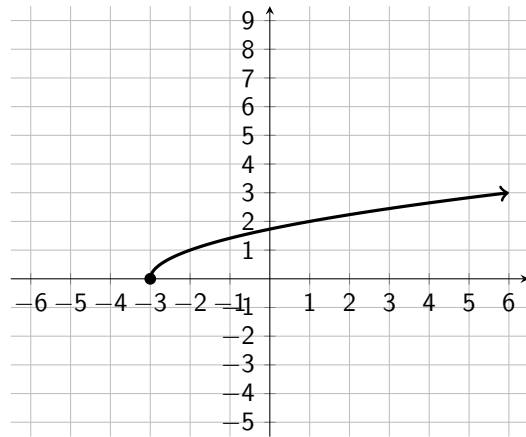
In other words, **domain** is all possible  $x$ -coordinates on the function's graph.

**Example 1.** Determine the domain of each. Write your answer as an inequality or a compound inequality.

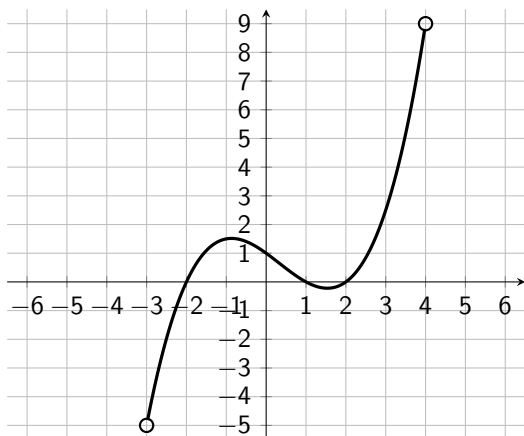
(a)



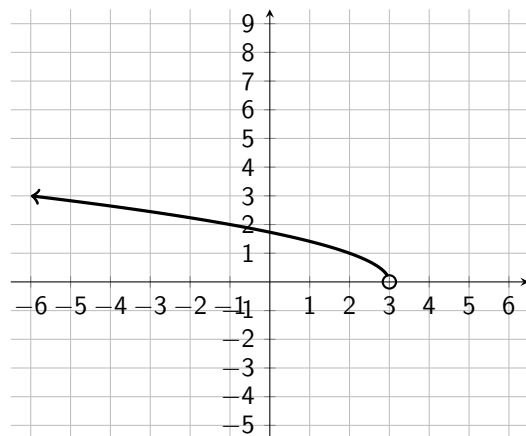
(b)



(c)



(d)



## Domain (Equations)

For most of the functions in this section of the notes, the domain will be **all real numbers**.

However, there are **2 exceptions**:

1. Functions with a variable in the denominator: denominator  $\neq 0$
2. Functions inside a square root:  $\sqrt{\geq 0}$

**Example 2.** State the domain of each.

(a)  $f(x) = 3x - 2$

(b)  $g(x) = 6x^2 + 4$

(c)  $h(x) = \sqrt{x - 7}$

(d)  $j(x) = \sqrt{2x + 4}$

(e)  $m(x) = \frac{5}{x-2}$

(f)  $p(x) = \frac{3}{x+9}$

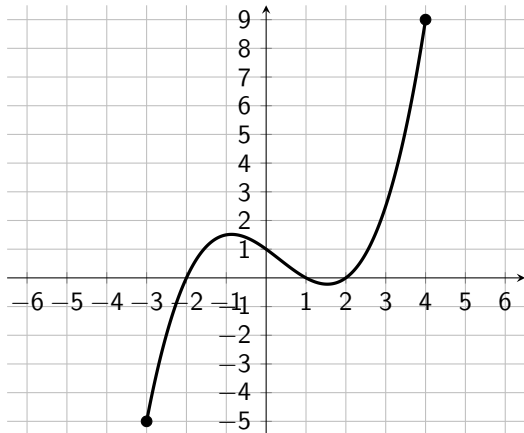
## Range (Visual)

The **range** of a function is the set of all possible outputs (usually  $y$ ) of the function.

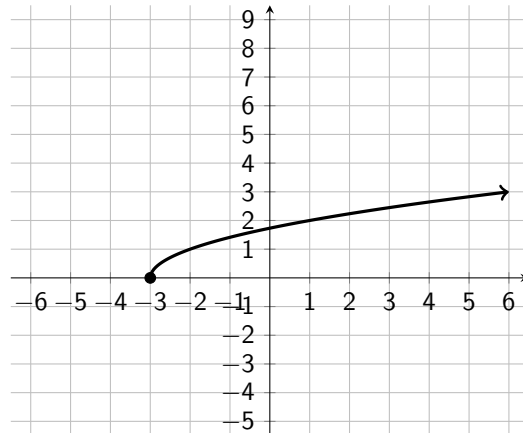
In other words, **range** is all possible  $y$ -coordinates on the function's graph.

**Example 3.** Determine the range of each. Write your answer as an inequality or a compound inequality.

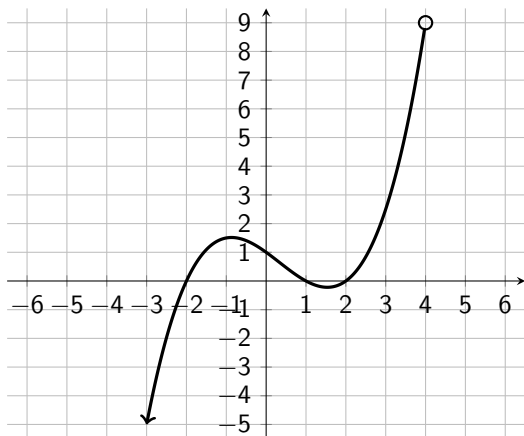
(a)



(b)



(c)



(d)

