CBSE Class 11 Maths Notes Chapter 2: Here are the Class 11 Maths Chapter 2 Relations and Functions Revision Notes based on the updated CBSE syllabus. Students can prepare for exams with great aid from the Revision Notes. To improve their exam scores, students should review these Chapter 2 Revision Notes on Relations and Functions.

Key mathematical ideas are covered in the Chapter Relations and Functions. Our subject matter experts have produced the solutions in simple language so that students can understand the mathematical topics that are difficult for them.

CBSE Class 11 Maths Notes Chapter 2 Overview

CBSE Class 11 Maths Notes Chapter 2 deals with relations and functions. We will review the ideas of functions and their relations in Chapter 2.

The subjects covered in this Class 11 Maths Chapter 2 notes include the following: multiplication of two real functions, quotient function, algebra of a real function, relations, functions, and distinct types of functions.

Important formulas are also contained in this chapter. This chapter provides methodical explanations of subjects through tasks and examples.

These ideas are also available for download from the Class 11 notes on relations and functions so that students can easily use them.

CBSE Class 11 Maths Notes Chapter 2

We will learn how to create a relation between two groups of things by linking pairs of objects in this chapter.

We will examine how a function can be categorized as a connection.

In conclusion, we will examine many categories of functions in addition to a few standard functions.

Relations

Cartesian Product of Sets

- Given two non-empty sets P and Q .

- The Cartesian product $P \times Q$ is the set of all ordered pairs of elements from P and Q that is

- $P \times Q = \{ (p, q) \; ; p \in P \; ; q \in Q \}$

Relation

- Let A and B be two non-empty sets.
- Then any subset 'R' of $A \times B$ is a relation from A and B.
- If $(a, b) \in R$, then we can write it as a $R\, b$ which is read as a is related to b 'by the relation R', ' b' is also called image of ' a' under R.

Domain and Range of a Relation

- If R is a relation from A to B, then the set of first elements in R is known as domain & the set of second elements in R is called range of R symbolically.
- Domain of $R = \{x : (x, y) \in R\}$
- Range of $R = \{y : (x, y) \in R\}$
- The set B is considered as co-domain of relation R.
- Note that,

$$\text{range} \subset \text{co-domain}$$

Note :

Total number of relations that can be defined from a set A to a set B is the number of possible subsets of $A \times B$.

If $n(A) = p$ and $n(B) = q$, then

$n(A \times B) = pq$ and total number of relations is 2^{pq} .

The inverse of a Relation

- Let A, B be two sets and let R be a relation from a set A to set B. Then the inverse of R denoted as R^{-1}, is a relation from B to A and is defined by

$$R^{-1} = \{(b, a) : (a, b) \in R\}$$

- Clearly

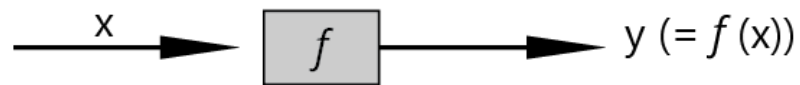$$(a, b) \in R \Leftrightarrow (b, a) \in R^{-1}$$

- Also,

$$\text{Dom}(R) = \text{Range}(R^{-1}) \text{ and}$$
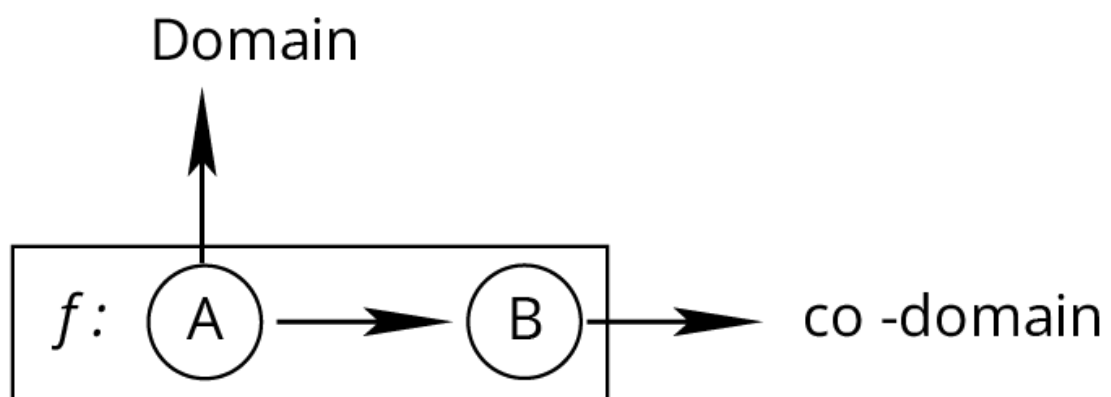
$$\text{Range}(R) = \text{Dom}(R^{-1})$$

Functions

A relation 'f' from set A to set B is said to be a function if every element of set A has one and only one image in set B.
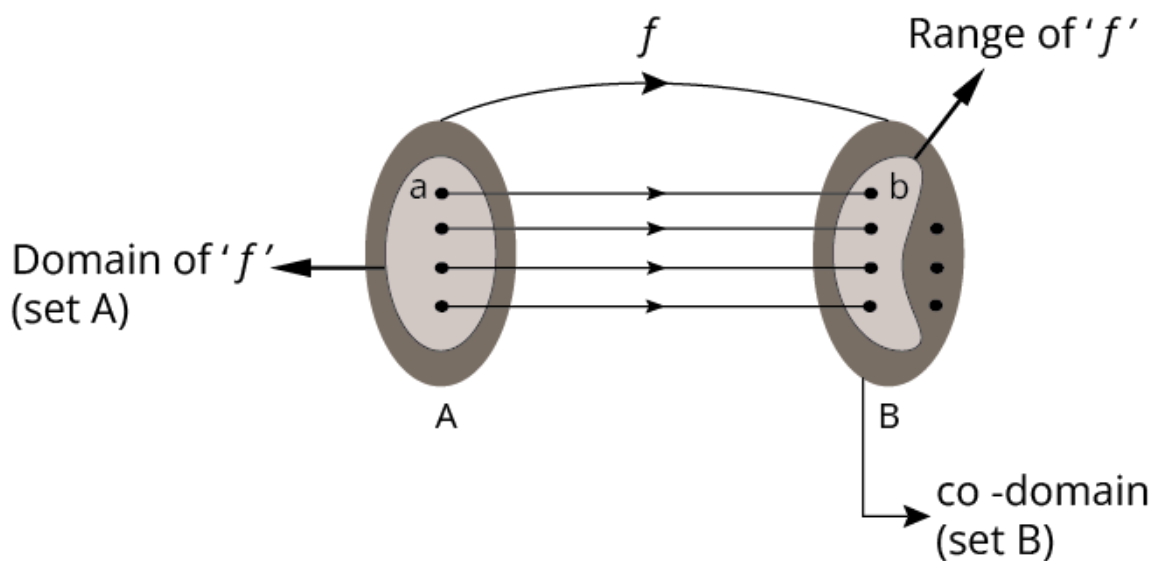
$$x \longrightarrow \boxed{f} \longrightarrow y\ (= f\,(x))$$

(Domain) input
(independent variable)

output (Range)
(dependent variable)

Domain

$$f: \quad (A) \longrightarrow (B) \longrightarrow \text{co -domain}$$

(reads as : f is a function
from set A to set B)

Domain, Co-domain, and Range of a function

The domain is believed to be the biggest set of x values for which the formula provides real y - values when

y = f(x)

is defined using a formula and the domain is not indicated explicitly.

The domain of   y=f(x)$y=f(x)$ is the set of all real x for which $f(x)$ is defined (real).

Rules for Finding Domain

1. Even roots (square root, fourth root, etc.) should have non–negative expressions.

2. Denominator $\neq 0$

3. $\log_a x$ is defined when x 0, a 0 and a $\neq 1$

4. If domain $y = f(x)$ and $y = g(x)$ are D_1 and D_2 respectively then the domain of $f(x) \pm g(x)$ or $f(x).g(x)$ is $D_1 \cap D_2$.

While domain of $\dfrac{f(x)}{g(x)}$ is $D_1 \cap D_2 - \{x : g(x) = 0\}$

Range

The set of all f - images of elements of A is known as the range of f and can be denoted as $f(A)$.

$\text{Range} = f(A) = \{f(x) : x \in A\}$

$f(A) \subseteq B$ {Range $\subseteq$ Co-domain}

The rule for Finding Range

First of all find the domain of $y = f(x)$

i. If domain $\in$ finite number of points $\Rightarrow$ range $\in$ set of corresponding $f(x)$ values.
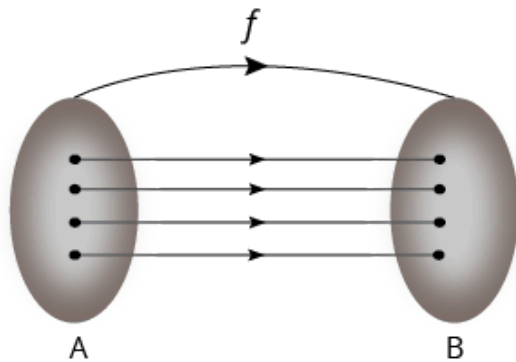
ii. If domain $\in R$ or $R-$ {Some finite points}

Put $y = f(x)$

Then express x in terms of y. From this find y for x to be defined. (i.e., find the values of y for which x exists).

iii. If domain $\in$ a finite interval, find the least and greater value for range using monotonicity.
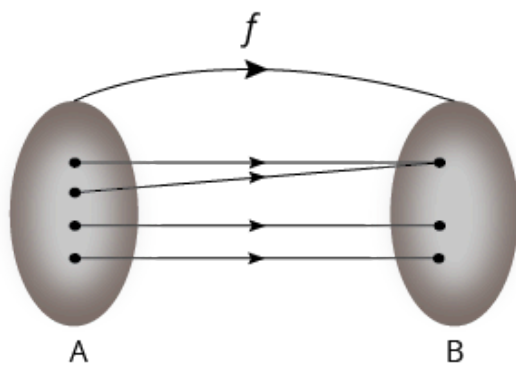
Kinds of Functions

Range = Co -domain

f

A   B
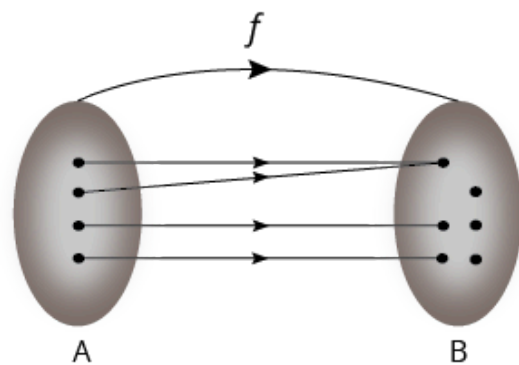
(one -to-one) & (onto)

Range $\subset$ Co -domain

f

A   B
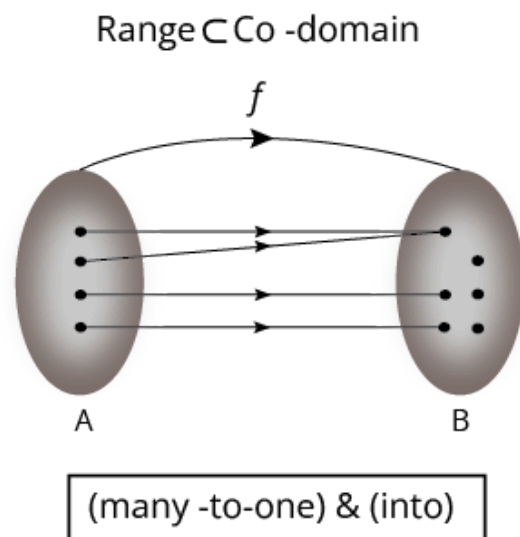
(one -to-one) & (into)

Range = Co -domain

f

A   B

(many -to-one) & (onto)

Range $\subset$ Co -domain

f

A   B

(many -to-one) & (into)

Range = Co-domain

f

A   B

(one-to-one) & (onto)

Range ⊂ Co-domain

f

A   B

(one-to-one) & (into)

Range = Co-domain
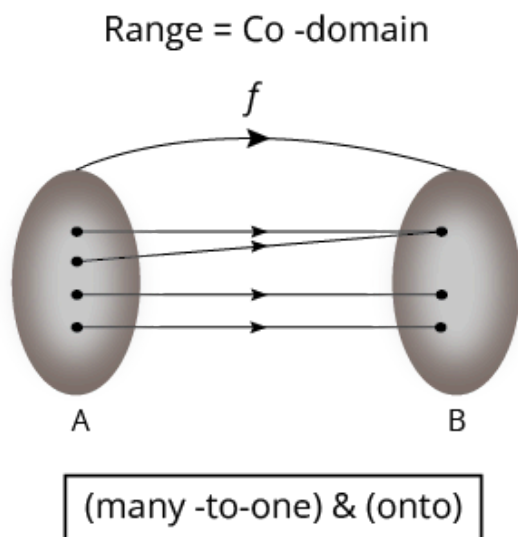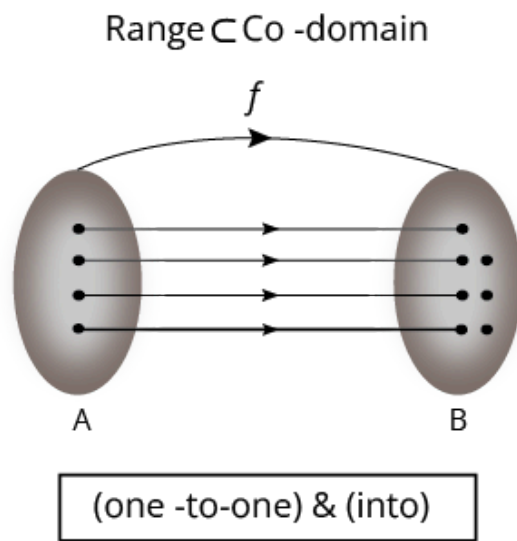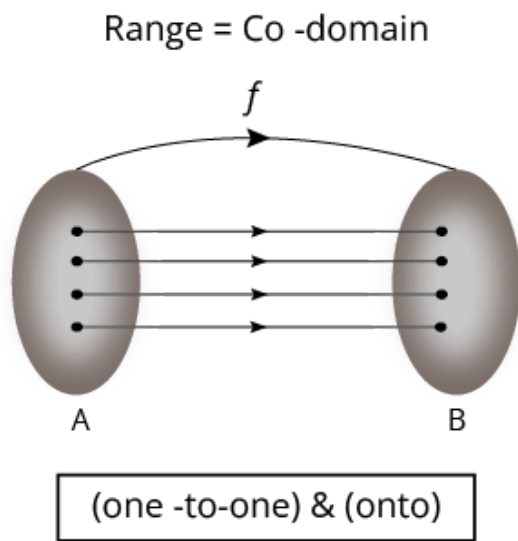
f

A   B

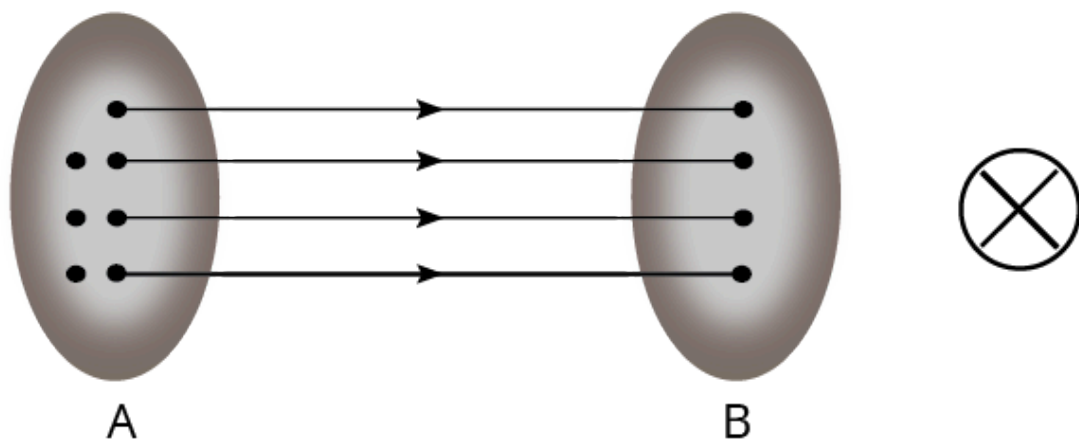(many-to-one) & (onto)

Range ⊂ Co-domain
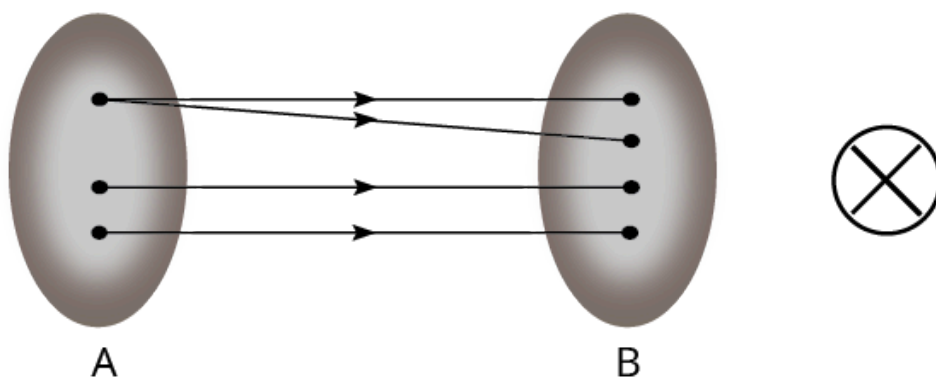
f

A   B
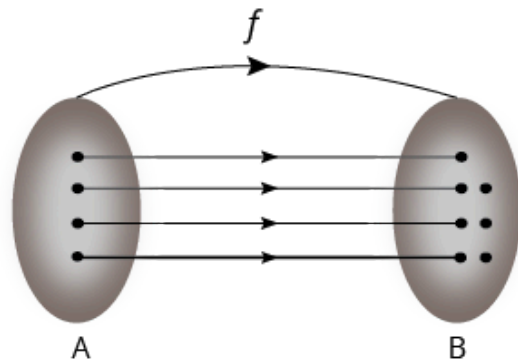
(many-to-one) & (into)

Note:

- Injective functions are called one-to-one functions.
- Surjective functions are also known as onto functions.
- Bijective functions are also known as (one-to-one) and (onto) functions.

Relations Which Cannot be Categorized as a Function

Not a function

Not a function ◀——one-to-many

Methods to check the one-one mapping

1. Theoretically:

$$f(x_1) = f(x_2)$$

$$\Rightarrow x_1 = x_2$$

then $f(x)$ is one-one.

2. Graphically:

A function is one-one, if no line parallel to $x - axis$ meets the graph of function at more than one point.
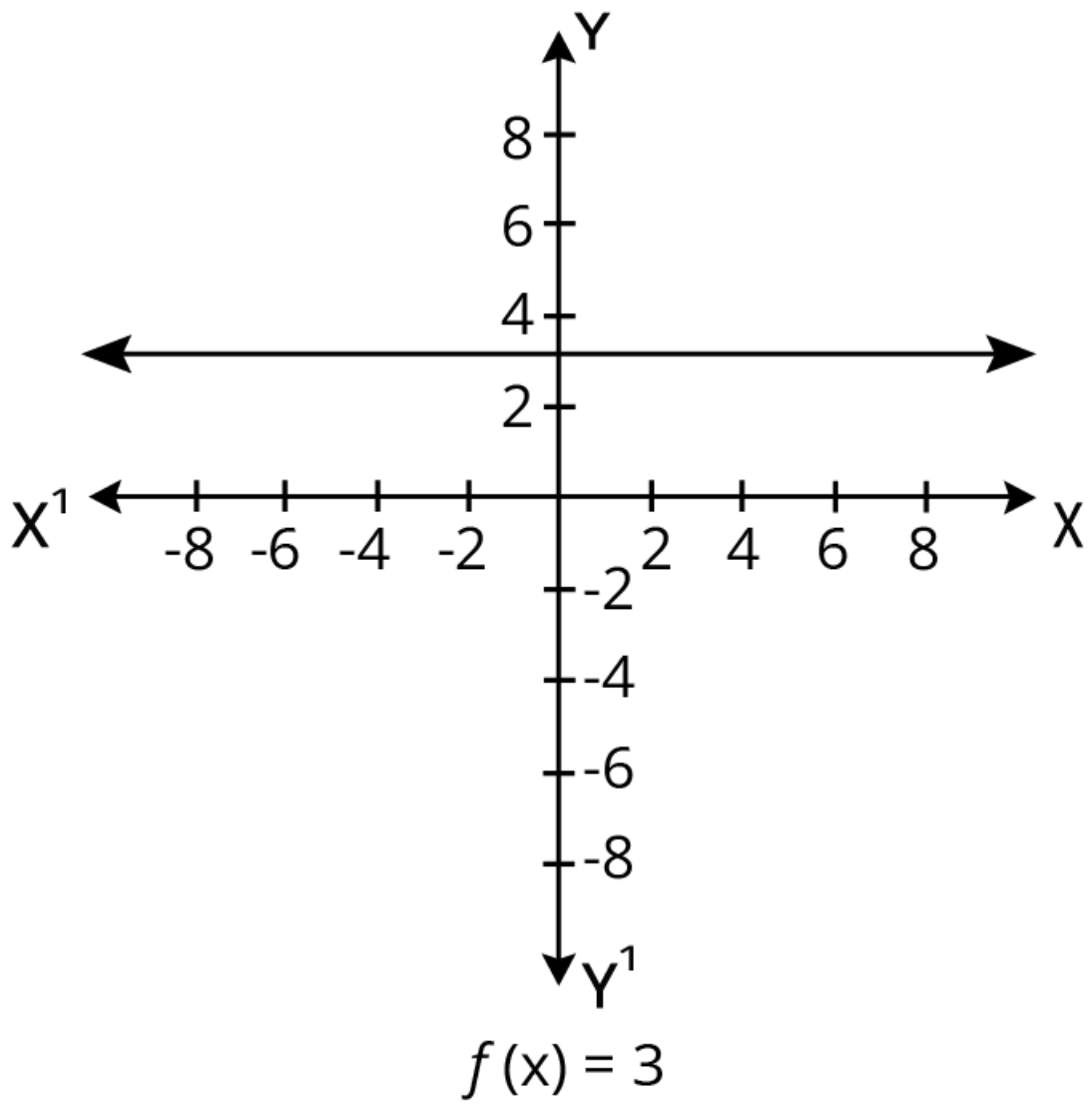
3. By Calculus:

For checking whether $f(x)$ is One-One, find whether function is only increasing or only decreasing in their domain. If yes, then function is one-one, that is if $f'(x) \geq 0, \forall x \in$ domain or, if $f'(x) \geq 0, \forall x \in$ domain, then function is one-one.

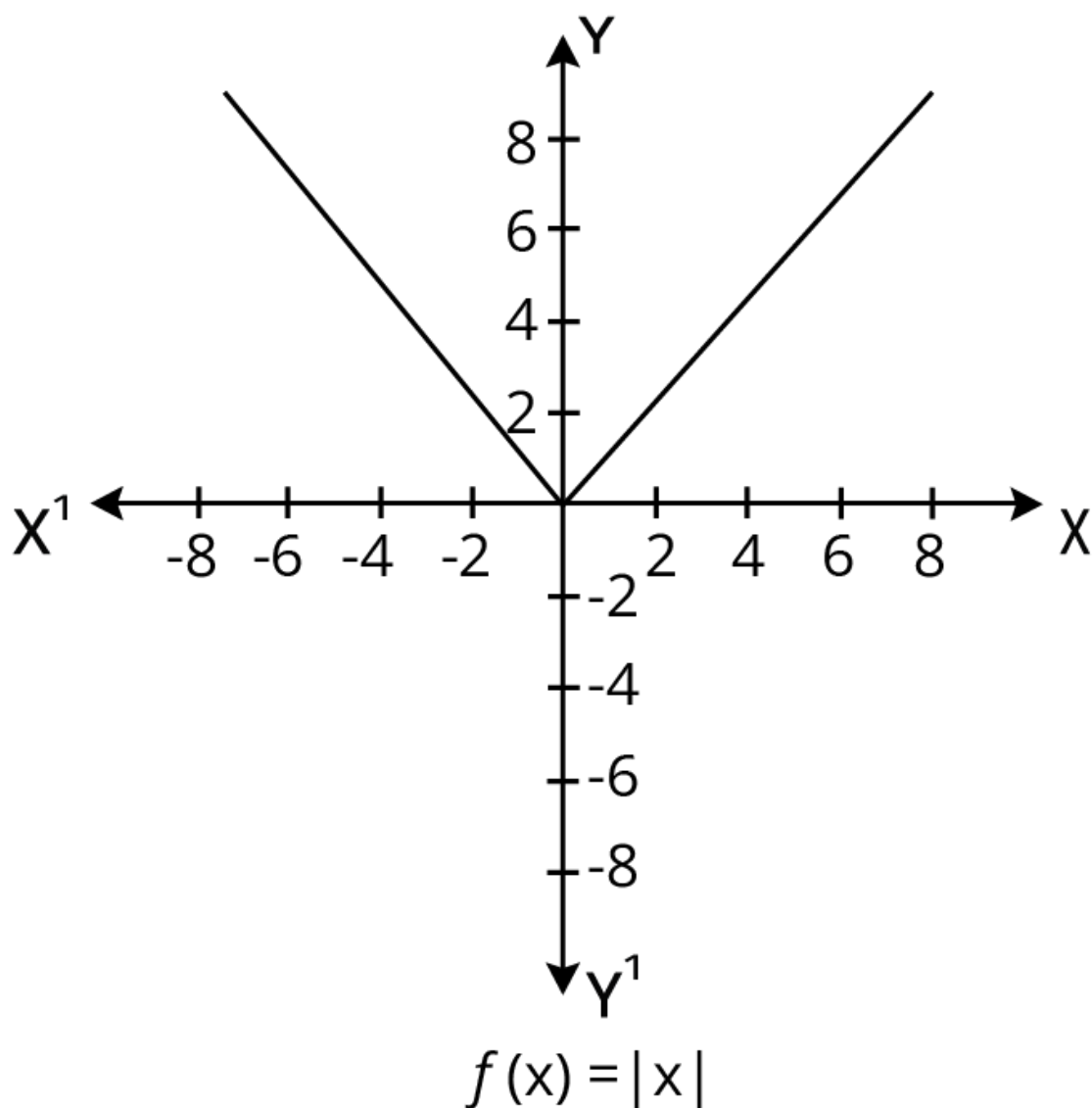# Some Standard Real Functions & their Graphs

$$f(x) = x$$
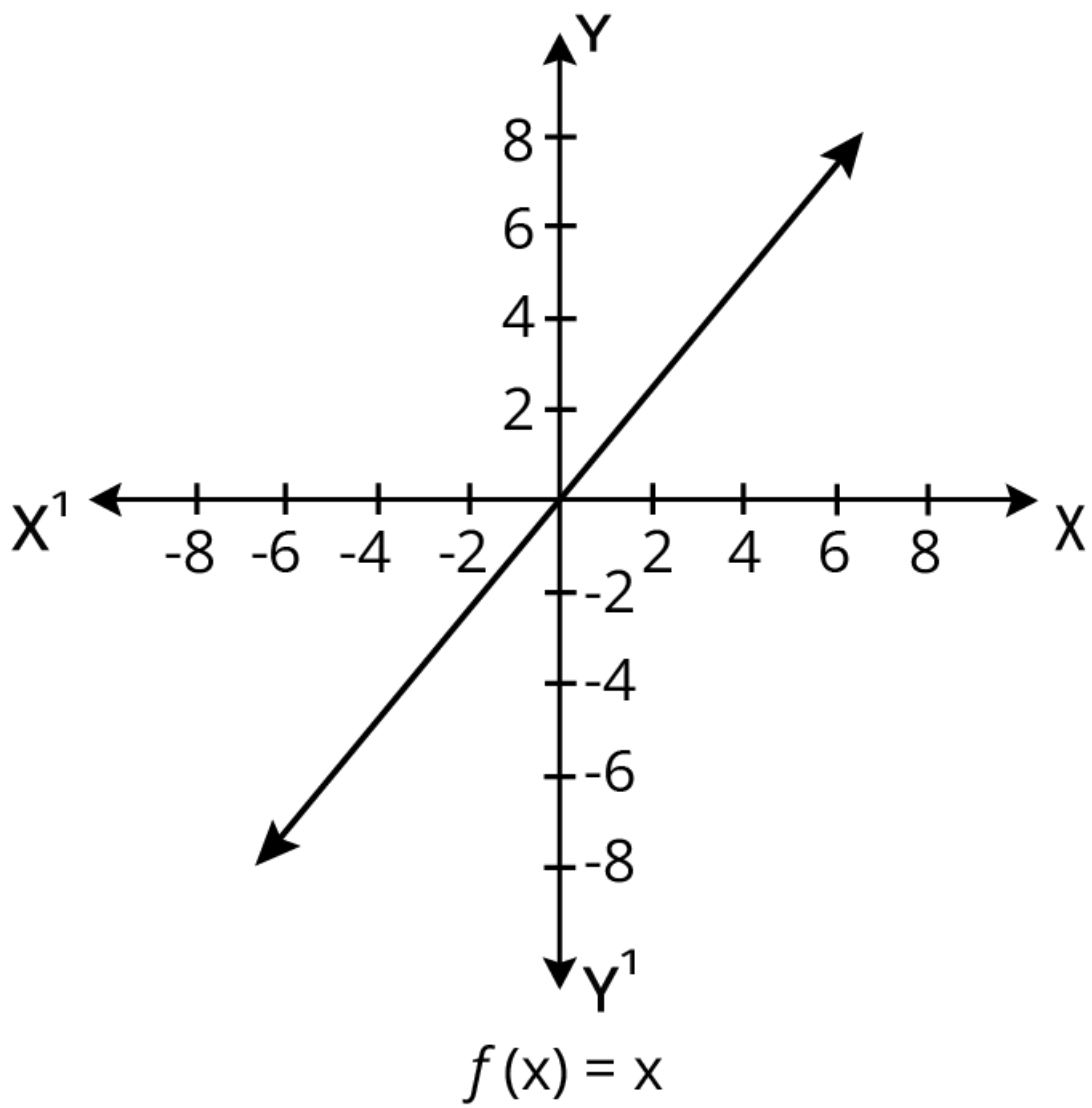
Constant Function

$f(x) = 3$

Modulus Function

$$f(x) = |x|$$

Kinds of Functions

One-to-one or injective functions: There is only one corresponding element in set B for each element in set A. If there are elements in set B that match none in set A, then those elements might exist.

Onto or Surjective Functions: Functions that are onto or surjective have elements in set A that match one or more times for each member in set B.

Bijective functions: One-to-one and Onto functions are referred to as bijective functions. When every member has one matching element in the other set and no element is left out, this is also known as the perfect pairing.

Benefits of CBSE Class 11 Maths Notes Chapter 2

All of the study materials you need for your exam preparation are available here. You can find NCERT solutions, syllabi, exam paper solutions from prior years, key questions, and more here.

This syllabus follows the guidelines set forth by the CBSE. Teachers with extensive experience produce the NCERT revision notes. The following are some advantages of our notes.

Solutions in Easy Language

Various professionals and researchers in the field prepare the revision notes for every chapter. Students can access the study materials provided by us only after conducting a thorough investigation to guarantee that all of the information is accurate and concise.

Focus on Fundamental Concepts

The chapter-by-chapter notes for NCERT Class 11 not only cover every topic on the syllabus, but they also clearly explain every fundamental idea needed to comprehend each topic.

Bette r Preparation

Students' test preparation will be improved, and their problems will be quickly cleared up with the help of Class 11 Maths NCERT Solutions. These revision notes will assist students in quickly understanding difficult ideas.

Important Topics

Key topics covered in the chapter are examined from an examination perspective.