Set Theory

Set

A **set** is a collection of distinct objects, called **elements** of the set

Eg: {1,2,3,4} are all numbers and make a set , {red, orange, yellow, green, blue, indigo, purple}; are all colours and of the same set

Variable can represent a set: Let A ={1,2,3,5}

An empty set is denoted by { } or ∅

Sub Set

A subset of a set *A* is another set that contains only elements from the set *A*, but may not contain all the elements of *A*.

If *B* is a subset of *A*, we write *B* ⊆ *A*

A proper subset is a subset that is not identical to the original set—it contains fewer elements.

If *B* is a proper subset of *A*, we write *B* ⊂ *A*

Eg: Let A ={1,2,3,4}, then a subset of A is {2,4)

Union

The union of two sets contains all the elements contained in both sets. The union is notated *A*⋃*B.*More formally, *x*∊ *A*⋃ *B* if *x*∈ *A* or *x*∈ *B* (or both)

Eg: Let A = {1,2,3,4} Let B = {4,5,6,7}

So A U B = {1,2,3,4,5,6,7}

Intersection

An intersection of two sets contains only contain items that are in both sets

Eg: Let A = {red,green,blue} Let B = {red,yellow,purple,orange}

So A ⋂ B = {red}

Complement

The **complement** of a set is every item that is not in the set referenced set

Eg: Let A = {1,2,3,4} Let B = {4,5,6,7}

So *AB* ⋂*B* would be {5,6,7}

Universal Set

A universal set is a set that contains all the elements we are interested in.

For example if we are searching through a table for employees with the First name ‘Smith’ the universal set would be all the records in the Employee table

Venn Diagrams

Cardinality

The number of elements in a set is the cardinality of that set.

Eg: Let A = {1,2,3,4,5,6,7}

So the cardinality of the Set is :  |*A*|  = 7

References :

<https://courses.lumenlearning.com/atd-hostos-introcollegemath/chapter/set-theory/>