**Mappings & Functions**

  

Domain

Range or Co-Domain

Starting value

Finishing value

“”

“” or “”

**Types of Mappings**

|  |  |  |
| --- | --- | --- |
| **Type** | **Example** | **Proof** |
| One to one |  | , (Not the same!) |
| Many to one |  | , … |
| Many to many |  |  |

The following is mapping but is not a function…

|  |  |  |
| --- | --- | --- |
| One to many |  | , … |

To clarify…

|  |  |  |
| --- | --- | --- |
| **Type** | **Mapping** | **Function** |
| One to one | Yes | Yes |
| Many to one | Yes | Yes |
| Many to many | Yes | Yes |
| One to many | Yes | No |

The difference between inverse-sin and arc-sin etc.

|  |  |  |
| --- | --- | --- |
| **Name** | **Function** | **Domain** |
| Inverse-sin | $$sin^{-1}x$$ | $$-\infty \leq x\leq \infty $$ |
| Arc-sin | $$sin^{-1}x$$ | $$-\frac{π}{2}\leq x\leq \frac{π}{2}$$ |

* To change a ‘many to one’ function to a ‘one to one’ function we restrict the domain:

 

 

 

 

**Composite Functions**

Given:

 and 

Then:

|  |  |
| --- | --- |
|  |  |
|  |  |

range of 1st function = domain of 2nd function

⇒ domain of 1st function restricted by range of 2nd function

Eg:

, R , 

Domain of = range of ⇒

**Inverse functions**

* Only exist for one to one functions

Eg:

 ⇔ 

 ⇔ 

 ⇔ 

And:



* The range of  is the domain of .
* Inverse functions are reflections of the original functions in the line .
* Specific values where  will always occur on the line . Therefore, to find these points solve .

For a function to be a ‘self inverse function’ then:



Eg:

 ⇔ 

 ⇔ 

* Self inverse functions are symmetrical about the line .