2.6 Algebra of functions

(1) **Scalar multiplication of a function:** $(c\,f)(x) = c\,f(x),$ where c is a scalar. The new function $c\,f(x)$ has the domain X_f.

(2) **Addition/subtraction of functions**

$(f \pm g)(x) = f(x) \pm g(x).$ The new function has the domain X.

(3) **Multiplication of functions**

$(fg)(x) = (g\,f)(x) = f(x)g(x).$ The product function has the domain X.

(4) **Division of functions :**

(i) $\left(\dfrac{f}{g}\right)(x) = \dfrac{f(x)}{g(x)}.$ The new function has the domain X, except for the values of x for which $g(x) = 0.$

(ii) $\left(\dfrac{g}{f}\right)(x) = \dfrac{g(x)}{f(x)}.$ The new function has the domain X, except for the values of x for which $f(x) = 0.$

(5) **Equal functions :** Two function f and g are said to be equal functions, if and only if

(i) Domain of f = Domain of g

(ii) Co-domain of f = Co-domain of g

(iii) $f(x) = g(x)\,\forall x \in$ their common domain

(6) **Real valued function :** If R, be the set of real numbers and A, B are subsets of R, then the function $f : A \to B$ is called a real function or real –valued function.