**Discrete Mathematical Structures**

**Week-3**

**Long Descriptive Questions**

**1, Can you help Sam solve the following problem?**

**f and g are two functions, both defined on the set of real numbers and k is a constant such that, f(x)=kx−4 ; g(x)=kx+6**

**If (f∘g)(x)=(g∘f)(x) for all values of x, what is the value of k?**

We have (f∘g)(x)=f(g(x)) and (g∘f)(x)=g(f(x)).

So,

(f∘g)(x)=f(g(x))=f(kx+6)=k(kx+6)-4=k^2x+6k-4

and

(g∘f)(x)=g(f(x))=g(kx-4)=k(kx-4)+6=k^2x-4k+6

Since (f∘g)(x)=(g∘f)(x) for all values of x, we can equate the expressions we obtained for (f∘g)(x) and (g∘f)(x):

k^2x+6k-4=k^2x-4k+6

Simplifying and rearranging terms, we get:

10k=10

k=1. Hence, the value of k is 1.

**2, Let F: R→R defined by F(x) = 2x-3 for all x in R, find F-1**

F(x)=2x-3

Let y=f(x)

Y=2x-3

2x=y+3

X=

f-1(x)= (y+3)/2