9.5 Compositions of functions

Two functions, *f* and *g*, can combined using a process called composition, which can be represented by *f(g(x)).* The input value for *g* is used as the output value for *f*.

Notation: 

This is sometimes read as “*f map g*” or *fog(x)*. The point *(a,b)* on the function *g* gets mapped onto the function *f* as (b,c). As a result the point becomes (a,c) or *fog(x).* See pg. 551.

Ex. For , determine:

1. 
2. 
3. 
4. 

It should be noted that  exists only where an element in the range of *g* is also in the domain of *f*. The function  exists only when the range of *g* overlaps the domain of *f*.

Ex. Let  and 

1. determine, and find its domain

Ex. Given , find two functions, *f* and *g*, such that 

Ex. If , show that .

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