

Math 250: Daily Preparation

Overview

In our study of functions, we have come to further appreciate how functions are *processes* at their core – indeed, processes that execute the task of associating each element in one particular set to one and only one element in another set. Whenever we think of a complex process in mathematics, it makes sense to try to understand that complex process in terms of simpler ones. This is one of the core ideas involved with *composite* functions: either how two simpler processes can be combined (by one following the other) to make a more complicated function, or how a complicated function can be viewed in terms of two simpler processes, one of which is followed by the other. Furthermore, this new approach to thinking about how two functions f and g can be combined by having one follow the other leads to a new *algebraic* perspective on functions: given two functions f and g on appropriate domains and codomains, we can often compute $g \circ f$, the *composition of f followed by g* . All of these ideas will be examined in more detail in Section 6.4 of our text.

Basic learning objectives

These are the tasks you should be able to perform with reasonable fluency **when you arrive at our next class meeting**. Important new vocabulary words are indicated *in italics*.

- Understand the definition of the composition of functions f and g , including how the domain of one such function must align with the codomain of the other.
- Understand the meaning of the notation “ $g \circ f$ ”.
- Be able to represent composition of functions on finite domains through arrow diagrams.
- Be able to represent a more complicated real function (such as $f(x) = \sqrt{x^2 + 1}$) as the composite of two simpler functions.

Advanced learning objectives

In addition to mastering the basic objectives, here are the tasks you should be able to perform in the near future **with practice and further study**:

- Use the ideas of composition, injections, and surjections together to prove statements involving composite functions.

Resources

Reading: Read pages 325-327.

Watching: Here are some additional resources that have been developed to support your learning:

- Screencast 6.4.1: <http://gvsu.edu/s/vR>

After class, Screencast 6.4.2 is very much worth your time.

Questions

Respond to the following questions on separate paper, as explained in the document that describes guidelines and expectations for daily preparatory assignments. You should be prepared to show me your responses at the start of class; I will review your work briefly sometime before the end of class.

1. Complete Preview Activity 1 on pp. 323-324.
2. Complete Preview Activity 2 on pp. 324-325.
3. Complete Progress Check 6.17 on p. 327.