

MATH 133 – Calculus with Fundamentals 1
Practice on Combinations of Functions
September 7, 2017

Background

In section 1.3, various ways of combining known functions to produce new ones are discussed. This also leads to some important classes of functions such as polynomial functions, rational functions, algebraic functions and transcendental functions.

Questions

- 1) Give an example of a function in each of the classes of functions from the Background above.
- 2) For each of the following pairs of functions f, g , compute both compositions $f \circ g$ and $g \circ f$.
 - (a) $f(x) = x^2 + 4x + 5$, $g(x) = \sqrt{x}$
 - (b) $f(x) = \frac{1}{x^2+1}$, $g(x) = \cos(x)$
 - (c) $f(x) = x + \frac{1}{x}$, $g(x) = f(x)$.
- 3) Express each of the following functions $F(x)$ as $F = f \circ g$ for some functions f, g :
 - (a) $F(x) = \sqrt{1 - x^2}$
 - (b) $F(x) = 2^{x^2}$
 - (c) $F(x) = \frac{1}{x^2+3x+2}$
- 4) Recall our “rule of thumb” on domains: If $f(x)$ is given by a formula, then unless stated otherwise we take the domain to be the set of all real x that yield a well-defined result in the formula. What are the domains of the functions F in question 3?