

Precalculus

Homework Lecture 11

1. Compute the composite functions $(f \circ g)(x)$, $(g \circ f)(x)$. Simplify your answer to a single fraction. Find the domain of the composite function.

(a) $f(x) = \frac{x+2}{x-2}, g(x) = \frac{x-1}{x+2}$.

(b) $f(x) = \frac{x+1}{3x-2}, g(x) = \frac{x-2}{x-1}$.

(c) $f(x) = \frac{2x+1}{3x-1}, g(x) = \frac{x-2}{2x-1}$.

(d) $f(x) = \frac{x+1}{x-2}, g(x) = \frac{x+2}{2x-1}$.

(e) $f(x) = \frac{5x+1}{4x-1}, g(x) = \frac{4x-1}{3x+1}$.

(f) $f(x) = \frac{3x-5}{x-2}, g(x) = \frac{x-2}{x-4}$.

(g) $f(x) = \frac{x-3}{x+2}, g(y) = \frac{y+3}{y-4}$.

2. Find the functions $f \circ g$, $g \circ f$, $f \circ f$ and $g \circ g$ and their implied domains. The answer key has not been proofread, use with caution.

(a) $f(x) = x^2 + 1, g(x) = x + 1$.

(b) $f(x) = \sqrt{x+1}, g(x) = x + 1$.

(c) $f(x) = 2x, g(x) = \tan x$.

In this subproblem, you are not required to find the domain.

(d) $f(x) = \frac{x+1}{x-1}, g(x) = \frac{x-1}{x+1}$.