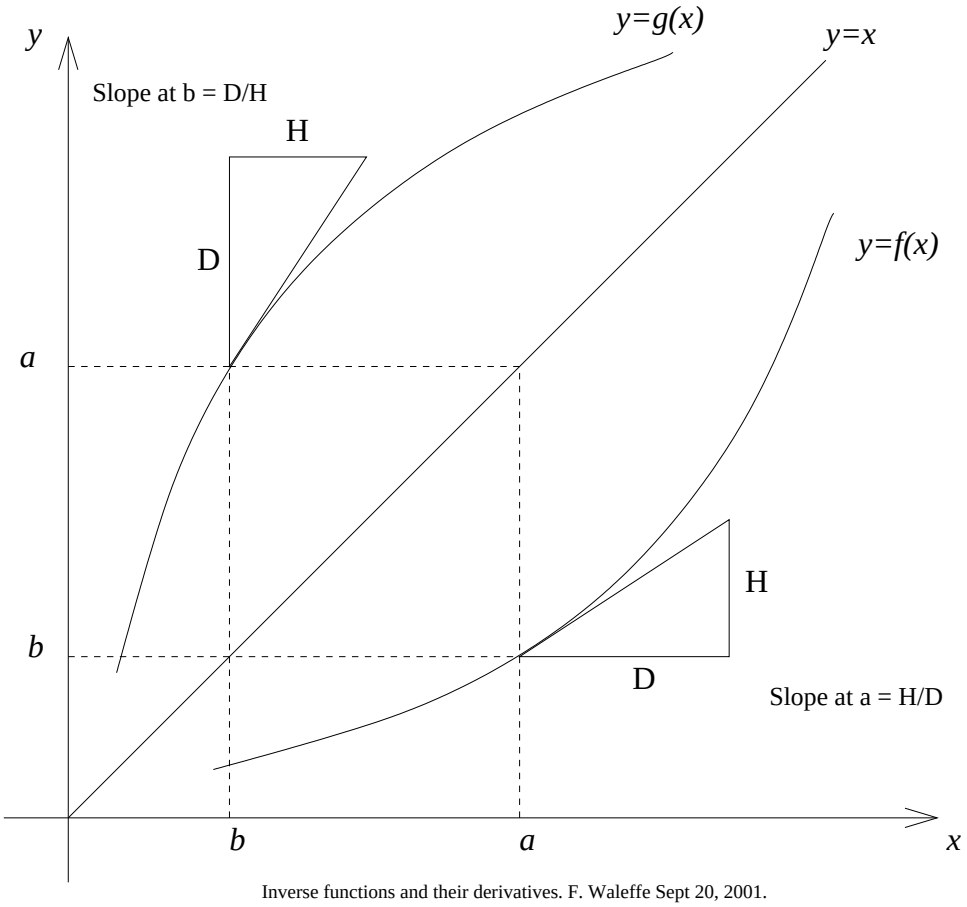
Math 221: Calculus and Analytic Geometry

F. Waleffe, Fall 2001

A graphic view of inverse functions and their derivatives



Inverse functions and their derivatives. F. Waleffe Sept 20, 2001.

$$g'(b) = \frac{1}{f'(a)}$$

with

$$f(a) = b, \quad g(b) = a, \quad f(g(x)) = g(f(x)) = x$$

This is perhaps more easily remembered without switching the meaning of x and y (in applications, variables keep their meaning and name, *e.g.* distance and time). If $y = y(x)$ then the inverse relationship is $x = x(y)$. The functions $y(x)$ and $x(y)$ are different from each other but their derivatives are related by

$$\frac{dx}{dy}(y) = \frac{1}{\dfrac{dy}{dx}(x)}.$$