1116-VR-74 **Alexander Y Vaninsky*** (avaninsky@hostos.cuny.edu), 500 Grand Concourse, Room B409, Mathematics Department, Bronx, NY 10451. *On a misconception about alternative definition of the logarithmic function in Calculus.*

There is a misconception about an alternative definition of the logarithmic function y = ln(x) as an integral of 1/t from 1 to x that may be found in almost all standard calculus texts. The authors typically show that main properties of the logarithms are held, so that the "new" definition is equivalent to the "old" one. However, this is not true. No matter how many properties of the two functions are proved to be the same, there may exist other properties that may differ. Moreover, one can hardly list all properties of the logarithmic function and prove them. What is actually needed, is using the Cauchy functional equation stating that the only continuous function satisfying the condition f(x+y)=f(x)+f(y) is the function y=Cx, and its corollary that the only continuous function satisfying the condition f(xy)=f(x)+f(y) for x,y >0 is the logarithmic function y=Cln(x). It is not difficult to show that C=1. This analytical characterization of the logarithmic function is missing from the calculus textbooks that creates confusion for readers in regard to the "new" logarithmic function. All properties of the "new" logarithmic function follow automatically from the coincidence of the two functions. They may serve as examples of the properties of the corresponding definite integrals. (Received September 15, 2015)