

INTRODUCTION

The statements of analysis can be grouped into three classes according to the depth to which the limit concept is used in their formulation and proof.

A first class consists of theorems which are entirely independent of the concept of limit, and deal with approximations. To this group belong graphical and numerical differentiation and integration as well as statements concerning the reciprocity of these two approximative operations.

A second class consists of formulae in whose proofs the concept of limit is used in a mild, so to speak, algebraic, way. This group comprises the bulk of formulae of calculus concerning elementary functions and some formulae concerning all differentiable functions: the rules for the formation of the derivatives of elementary functions, the determination of antiderivatives by substitution and by parts, etc. (Not included in this group is the theorem that each two antiderivatives of the same function differ at most by a constant).

A third group of statements is based on the assumption that in each closed interval each continuous function assumes its maximum. To this group belong the mean value theorem and its applications, of which I mention the Taylor development and its implications concerning maxima and minima, indeterminate forms, and the theorem about the antiderivatives of the same function.