CHAPTER I

INTRODUCTION

The concept of tangency may be explained by two definitions. The first definition that we have known from elementary geometry which is known as the work of Euclid states that "the tangent at any point of a circle is defined to be a straight line which meets the circle there, but, being produced, does not cut it.*"

The second definition that we have known from higher geometry and calculus is that a tangent line to a curve at a point P on the curve is defined to be the limiting position of a secant drawn through P and a neighbouring point Q on the curve, and Q is let to move along the curve and approach P indefinitely.

The second definition may be considered as an extension of the first, for in the case of a circle the two definitions are the same.

From the second definition we may prove that the line $y = 0$ is the tangent line to the curve $y = x^3$ at the point where $x = 0$, but in fact it cuts the curve there.

The word "cut" may be defined in the following manner : "a straight line is said to cut a curve at the point P when points on the curve in every deleted neighbourhood of P lie on both sides of the straight line."

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*Loney, S.L., The Elements of Coordinate Geometry, p. 125.

Thinking about the phrase "does not cut it" in the first definition, the author has determined to present another extension of the first definition. The extended definition is that the tangent at any point P on the curve is defined to be a uniquely determined straight line which meets the curve at the point P such that every point on the curve in some deleted neighbourhood of P lies on one and only one side of the straight line.

According to this extended definition, this thesis is established.