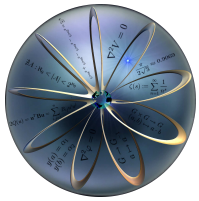

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order of contact

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Suppose that A and B are smooth curves in $\mathbb{R}^n$ which pass through a common point P. We say that A and B have zeroth order contact if their tangents at P are distinct.

Suppose that A and B are tangent at P. We may then set up a coordinate system in which P is the origin and the x_1 axis is tangent to both curves. By the implicit function theorem, there will be a neighborhood of P such that A can be described parametrically as $x_i = f_i(x_1)$ with $i = 2, \ldots, n$ and B can be described parametrically as $x_i = g_i(x_1)$ with $i = 2, \ldots, n$. We then define the *order of contact* of A and B at P to be the largest integer m such that all partial derivatives of f_i and g_i of order not greater than m at P are equal.