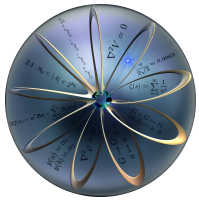

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integral curve

Canonical name	IntegralCurve
Date of creation	2013-03-22 15:16:31
Last modified on	2013-03-22 15:16:31
Owner	matte (1858)
Last modified by	matte (1858)
Numerical id	5
Author	matte (1858)
Entry type	Definition
Classification	msc 53-00

Definition Suppose M is a smooth manifold, and X is a smooth vector field on M. Then an **integral curve** of X through a point $x \in M$ is a curve $c\colon I \to M$, such that

$$\begin{aligned} c'(t) &= (X \circ c)(t), \quad \text{for all } t \text{ in } I \\ c(0) &= x. \end{aligned}$$

Here $I \subset \mathbb{R}$ is some open interval of 0, and $c'(t)$ is the tangent vector in $T_{c(t)}M$ represented by the curve.

Suppose x^i are local coordinates for M, c^i are functions representing c in these local coordinates, and $X = X^i \frac{\partial}{\partial x^i}$. Then the condition on c is

$$\frac{dc^i}{dt}(t) = X^i \circ c(t), \quad \text{for all } t.$$