

Tangent vectors to curves.

We shall now explain how our machinery relates to the classical notion of a tangent vector to a curve:

$$\gamma: (a, b) \longrightarrow M$$

If $M = U$ open in \mathbb{R}^n , the model is $\gamma'(t)$,

We can also write this via $T\gamma(t, 1) \in T(U)$

$$\begin{array}{ccc} (a, b) & \longrightarrow & T(a, b) \cong (a, b) \times \mathbb{R} & \longrightarrow & T(U) = U \times \mathbb{R}^n \\ t & & (t, 1) & & (\gamma(t), \gamma'(t)) \end{array}$$

So the general definition of the tangent vector to γ at time t should be $\boxed{T\gamma(t, 1) \in T(M)}$