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On natural derivatives and the curvature formula in fibre bundles

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In a fibre bundle, natural derivatives of a section are defined as tangent vector fields on the image of a section of the fibre bundle. A local extension to vector fields in the tangent bundle leads to a direct proof of the formula expressing the curvature of a connection in terms of covariant derivatives. The result is based on a tensoriality argument and extends to nonlinear connections on fibre bundles a well-known formula for linear connections on vector bundles.

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