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Lie proved a theorem for first order ordinary differential equations which gives a formula correlating integrating factors with "one-parameter symmetries" of the equation. The standard proof in the literature uses a symmetry condition together with the characterization of exactness in terms of partial derivatives. We give a proof which instead is based on Lie's remarks concerning the underlying geometry of the solution set. In this way the geometric significance of these objects is made explicit and the formula emerges naturally from a projection. Also, for the first-order o.d.e. the Lie algebra of symmetries is completely characterized, without having to use the jet bundle. (Received October 02, 2000)