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In this work we consider the relationship between initial/boundary value problem in a domain Ω for heat equation, Schiffer problem (overdetermined Neumann problem) and isoparametric hypersurfaces. Earlier, S. Sakaguchi showed that in R^n , under special condition on a continuum family of surfaces, either initial function must be a Neumann eigenfunction of Ω or $\partial\Omega$ must be at least partly but not necessarily completely isoparametric. We show that in R^n and some other non-compact symmetric spaces, given the same condition on only one surface - $\partial\Omega$, either initial function must be a finite sum of Neumann eigenfunctions or Ω must be a ball or annulus. Further, for domains Ω in compact symmetric spaces, the same condition as S. Sakaguchi's in R^n can be satisfied when initial function is not Neumann while $\partial\Omega$ doesn't contain isoparametric pieces at all. (Received September 30, 2000)