

1067-35-1703

Diane Denny* (diane.denny@tamucc.edu), Department of Mathematics and Statistics, Texas A&M University-Corpus Christi, 6300 Ocean Drive, Corpus Christi, TX 78412. *Existence of a unique solution to a quasilinear elliptic equation with data at an interior point of the domain.* Preliminary report.

We prove the existence of a unique classical solution $u(\mathbf{x})$ to the quasilinear elliptic equation $-\nabla \cdot (a(u)\nabla u) + \mathbf{v} \cdot \nabla u = f$, where $u(\mathbf{x}_0) = u_0$ at a point $\mathbf{x}_0 \in \Omega$ and where $\mathbf{n} \cdot \nabla u = g$ on the boundary of the domain Ω . Applications include stationary heat/diffusion problems with convection and with a source/sink where the value of the solution is known at a spatial location $\mathbf{x}_0 \in \Omega$ and where $\mathbf{n} \cdot \nabla u$ is known on the boundary. (Received September 21, 2010)