Note on an eigenvalue problem

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During the first few minutes of my talk I plan to discuss my memories of Seppo and his work. After that we indicate what is known about p-harmonic functions $v > 0$ of the form

$$v(x) = v(r, \theta) = r^\lambda f(\theta), \quad \lambda > 0,$$

in K when either K is Euclidean n-space or a cone, in which case we also assume $v \equiv 0$ on $\partial K \setminus \{0\}$. Here $x = (x_1, \ldots, x_n)$ and $r = |x|, x_1 = r\cos\theta, 0 \le \theta \le \pi$. If $K(\alpha) = \{(r, \theta) : 0 < \theta < \alpha\}, \alpha \in (0, \pi]$, we then survey what is known about the relationship between α, λ, for a fixed $p > 1$, and our attempts to solve a related eigenvalue problem for a nonlinear first order differential equation when $\alpha = \pi$ and $p > n - 1$. Next we sketch a finess type argument which shows for $\alpha = \pi$ and $n > p > n-1$ that $\lambda = 1-(n-1)/p$. Time permitting we also discuss generalizations and applications of this result.