(i)
$$\left.\begin{aligned} x &= e^{-y\pi/2}\cos(x\pi/2) \\ y &= e^{-y\pi/2}\sin(x\pi/2) \end{aligned}\right\} \Rightarrow \left\{\begin{aligned} x^2 + y^2 &= e^{-y\pi} \\ x &= y\cot(x\pi/2) \end{aligned}\right\}$$

$$\Rightarrow x = \cos\left(\frac{x\pi}{2}\right)\exp\left(-\frac{\pi x\tan(x\pi/2)}{2}\right)$$

so x can be found by fixed-point iteration or Newton-Raphson.

(ii) A couple of interesting articles on similar themes occurred in the *Gazette* in 1983 [2, 3]. Both of these cite Macintyre [4] for a proof that (i^i) converges.

References

1. Greg Parker and Steve Abbott, Complex power iterations, *Math. Gaz.* **81** (November 1997) pp. 431-434.
2. P. J. Rippon, Infinite exponentials, *Math. Gaz.* **67** (October 1983) pp. 189-196.
3. Peter L. Walker, Iterated complex radicals, *Math. Gaz.* **67** (December 1983) pp. 269-273.
4. A. J. Macintyre. Convergence of i^i, *Proc. Amer. Math. Soc.* **17**, (1966) p. 67.

Yours sincerely,

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DEAR EDITOR,

Since Bill Richardson showed kind concern for the state of my health in his Presidential Address (reprinted in the *Gazette* of November 1997), I should like to say that I feel fitter now than I did when I wrote to him at the end of 1996. Although I have Parkinson's disease, I continue to enjoy the normal activities of life such as hill-walking and Scottish dancing. More importantly, I am still lecturing part-time and doing as much geometry as ever. If I fail yet again to appear at the 1998 Conference it will be because I am planning a trip to New Zealand!

Yours sincerely,

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