

General notes pertaining to Needham, Chapter 12.

G. Palmer, December 20, 2018, 9:15 am PST

The concept of harmonic functions is important to this chapter. Vasco (personal communication, Forum) pointed out that, where $F = |f|$, “it can be shown that $\Delta(|f|^2) = \Delta(F^2) = 4|f'|^2$ and so $F^2 = |f|^2$ is only harmonic if f is a constant.” Presumably, this implies that $|f|$ is only harmonic if f is a constant. Then $|f|$ plotted above a circular region would be constant (a plane).

Vasco notes that “if $f = u + iv$ is analytic then f is harmonic and so are the real functions u and v .”