Ross Miller

1. [0, 2π]

With this function, unlike the previous, it’s possible to apply both theorems which is why I think I made the mistake of writing .5 + sin(x) instead of .5\*sin(x). Firstly, the function has a fixed point since the function is continuous on [0, 2π] and g(x) ϵ [0,2π] for all x ϵ [0,2π]. With g’(x) = .5\*cos(x) it’s much easier to find k = .5. With E = 1e-2, and P0 = 1, calculating the number of iterations we might expect, we get an answer of 8.98, so about 9 iterations are required.

n | g(Pn-1) = Pn | Pn - Pn-1 | E = 1e-02 | P0 = 1.00

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001 3.5623 2.5623

002 2.9374 0.6250

003 3.2430 0.3056

004 3.0910 0.1520

005 3.1669 0.0759

006 3.1289 0.0379

007 3.1479 0.0190

008 3.1384 0.0095