

Quiz 02

Oct 13, 2017.

1. Consider the following recursive equation $p_0 = 1$, $p_1 = a_1$, $p_n = \frac{10}{3}p_{n-1} - p_{n-2}$. For what values of a_1 is it stable in relative error? Explain.
2. The file an.txt contains a sequence stored as ' n, a_n ' at n th line. Find its rate of convergence. Express your answer as $O(\beta_n)$ and find β_n explicitly. Show details.
3. Find a root of $x = 2 \cos x$ with 10 correct decimal digits using any numerical method of your choice. Put (1): the detail formula, (2): x_0, x_1 and (3): the answer x^* , on the answer sheet, but need not hand in the code.
4. Show that the nonlinear equation $x = 1 + \cos(x)/2$ has a solution in $[1, 1.5]$. Let $x_0 = 1.25$, give an estimate on N (need not be optimal) such that $|x_n - x^*| < 10^{-5}$ for all $n \geq N$.
5. The first few iteration $(p_i, f(p_i))$, $i = 0, 1, 2, 3$ of method of false position for some equation $f(x) = 0$ is given in q2p4.txt. Find p_4 (4 digits will do). Also give your formula for finding p_4 and explain.

Need not hand in your code this time. Double check your answers carefully.

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