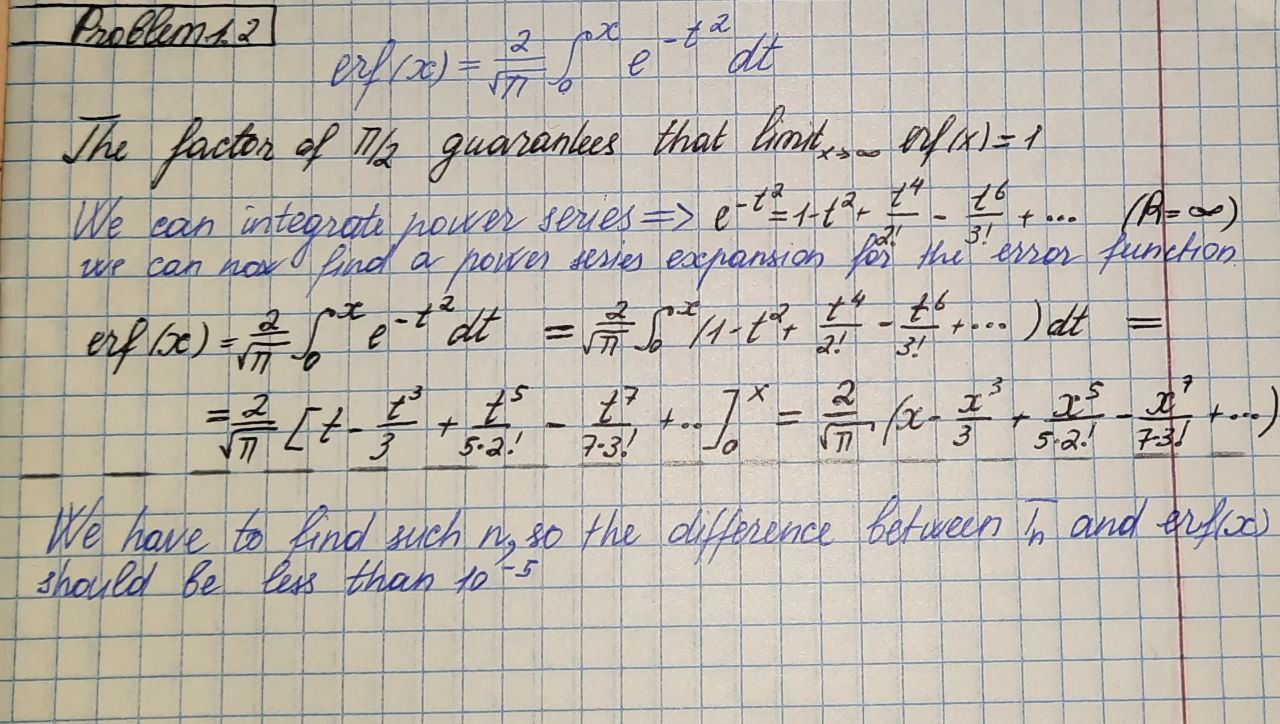
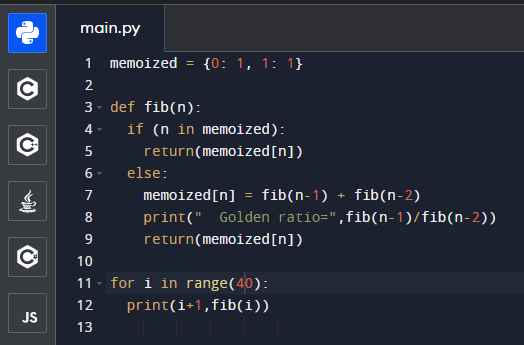
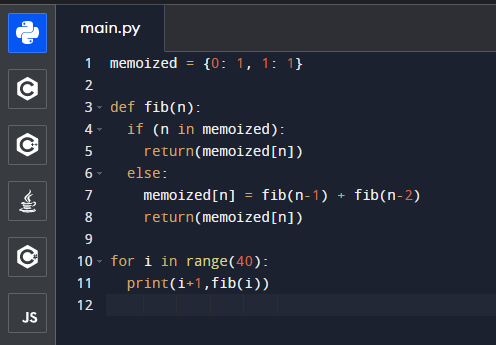
**Homework 2**

**Ex.1**

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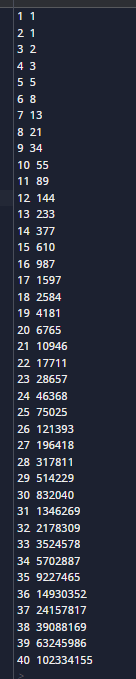
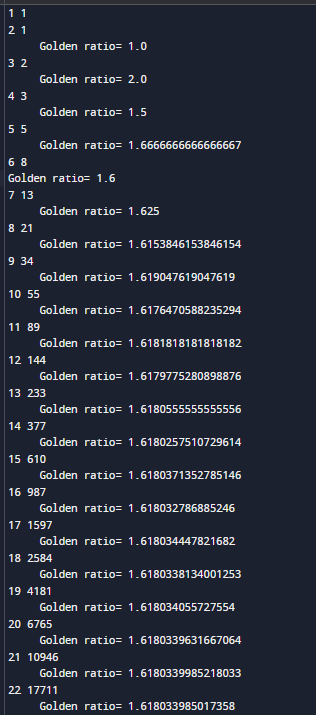
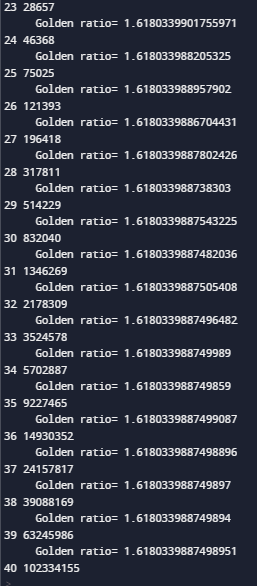
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**Ex.2**

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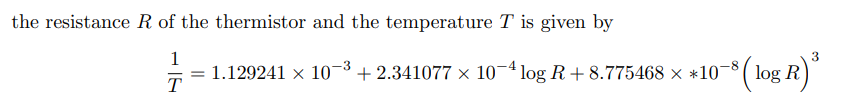
The ratio of successive Fibonacci numbers approaches the golden ratio. Here’s a program to explore this connection.

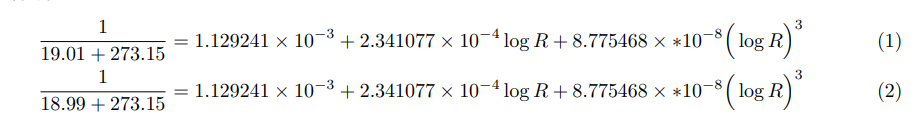
Program that generates Fibonacci numbers

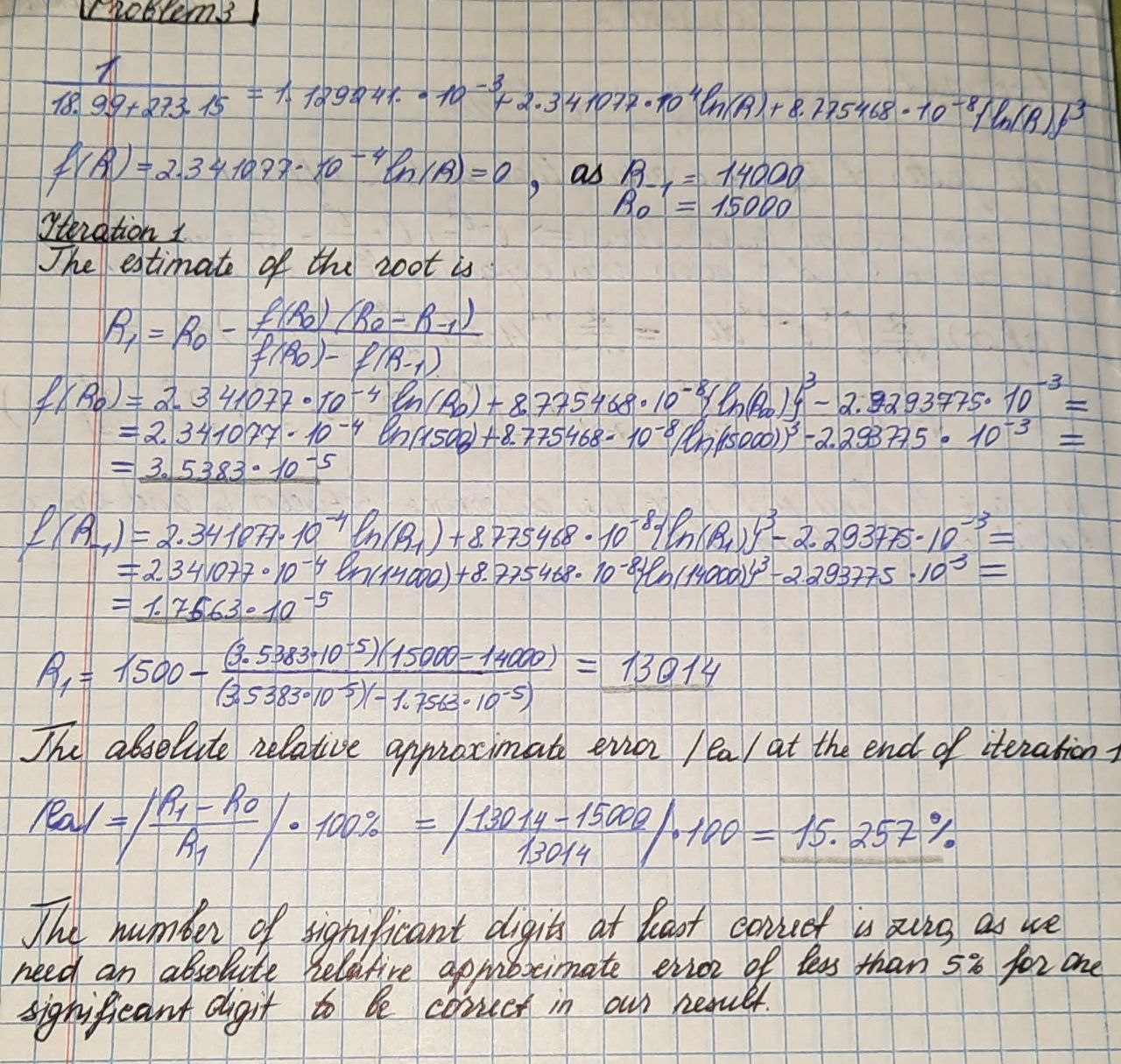


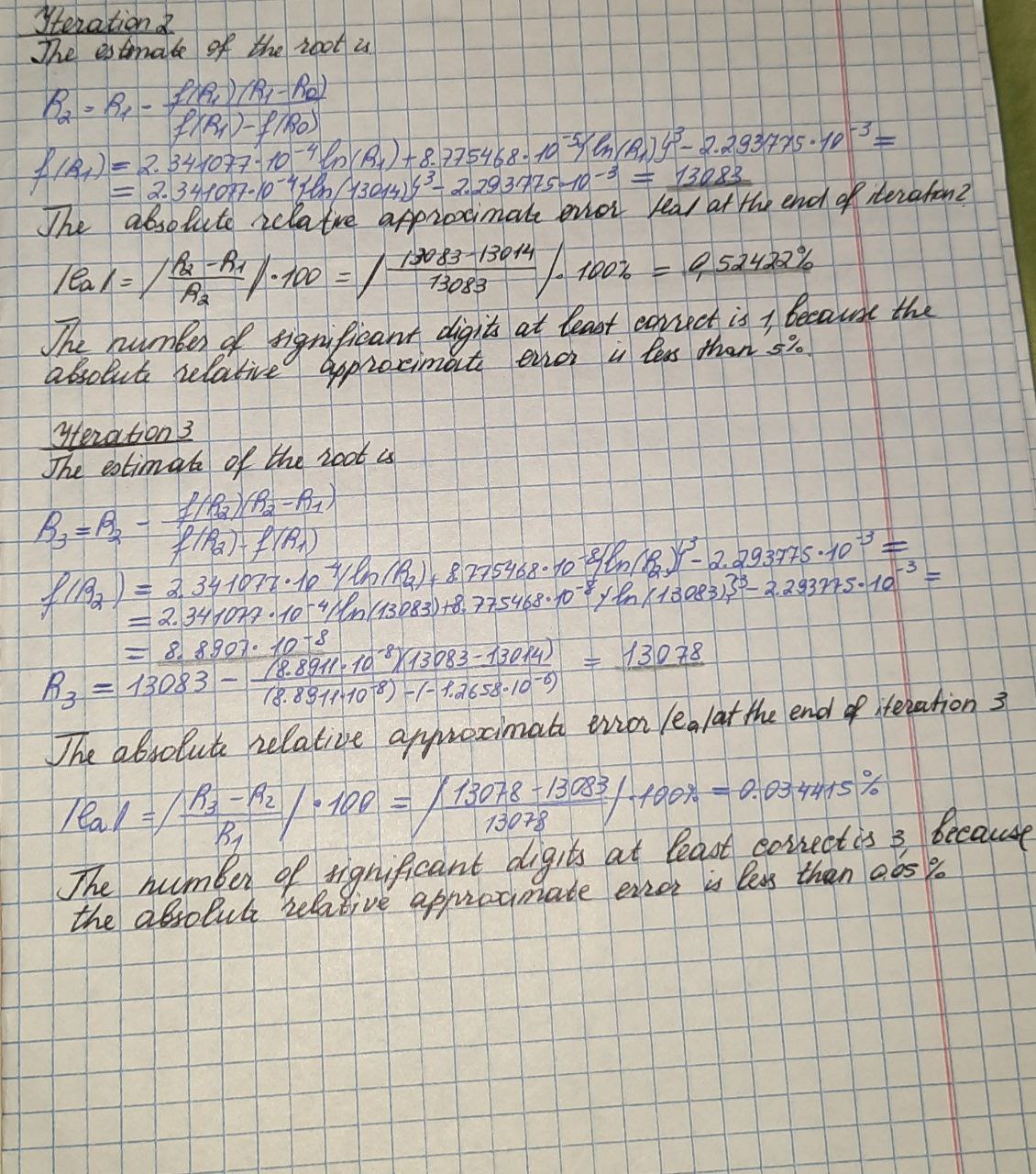
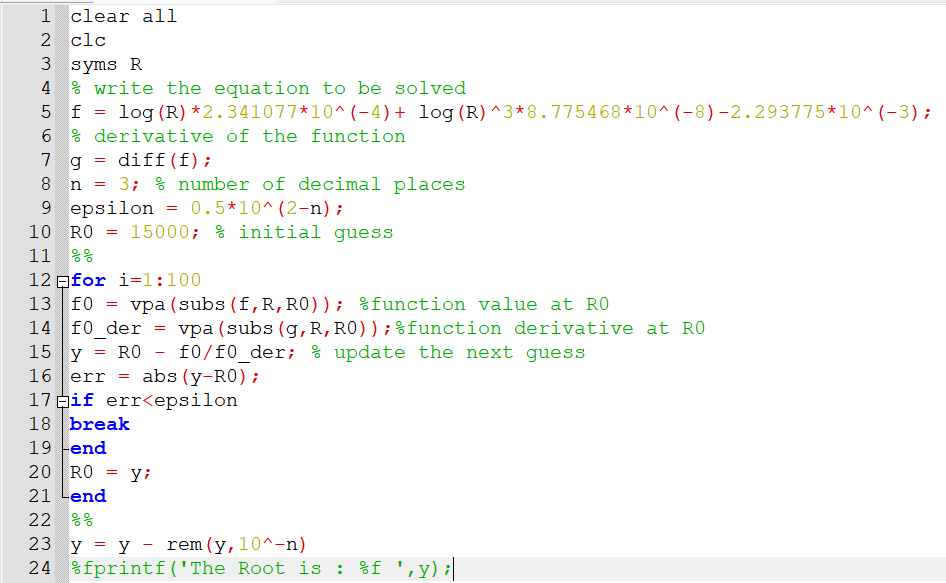
Thus we have found that the ratio of successive terms of a Fibonacci sequence a\_{n+1}/a\_n, which is equal to b\_n/a\_n, converges to the Golden Ratio.

**Ex.3**

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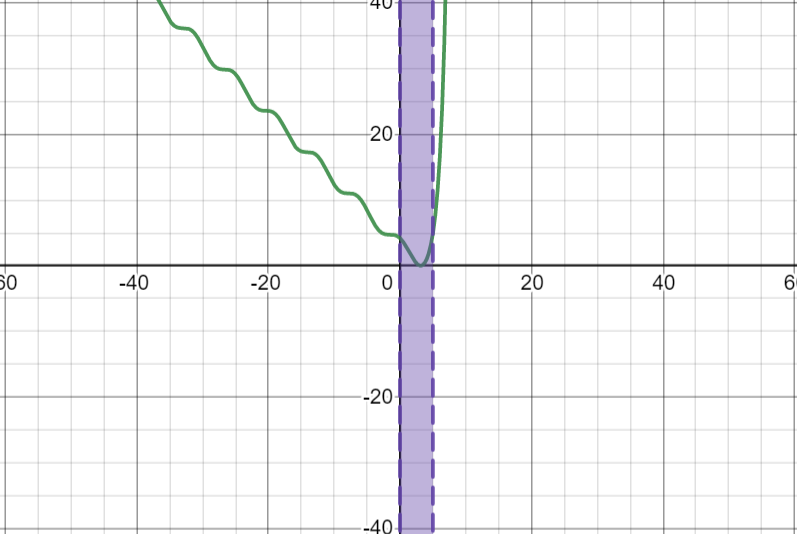
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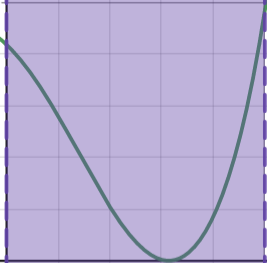
Ex.3 Matlab

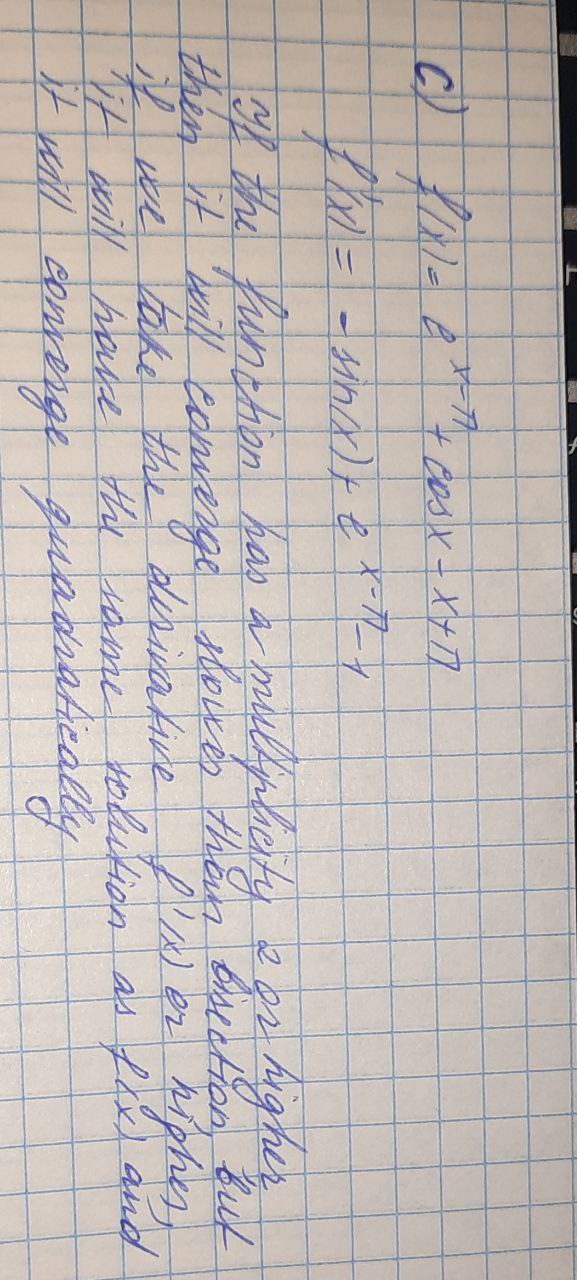
**Ex.4**

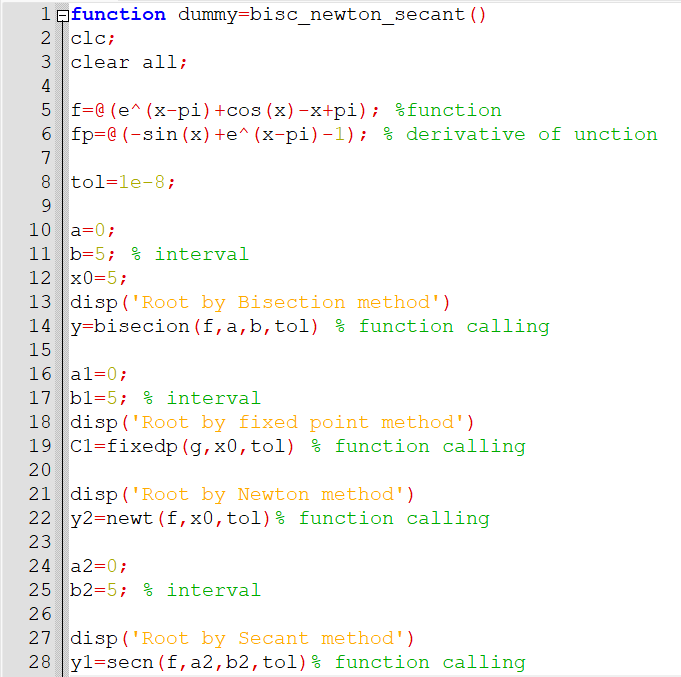
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Order of convergence= 1.9617575539126844

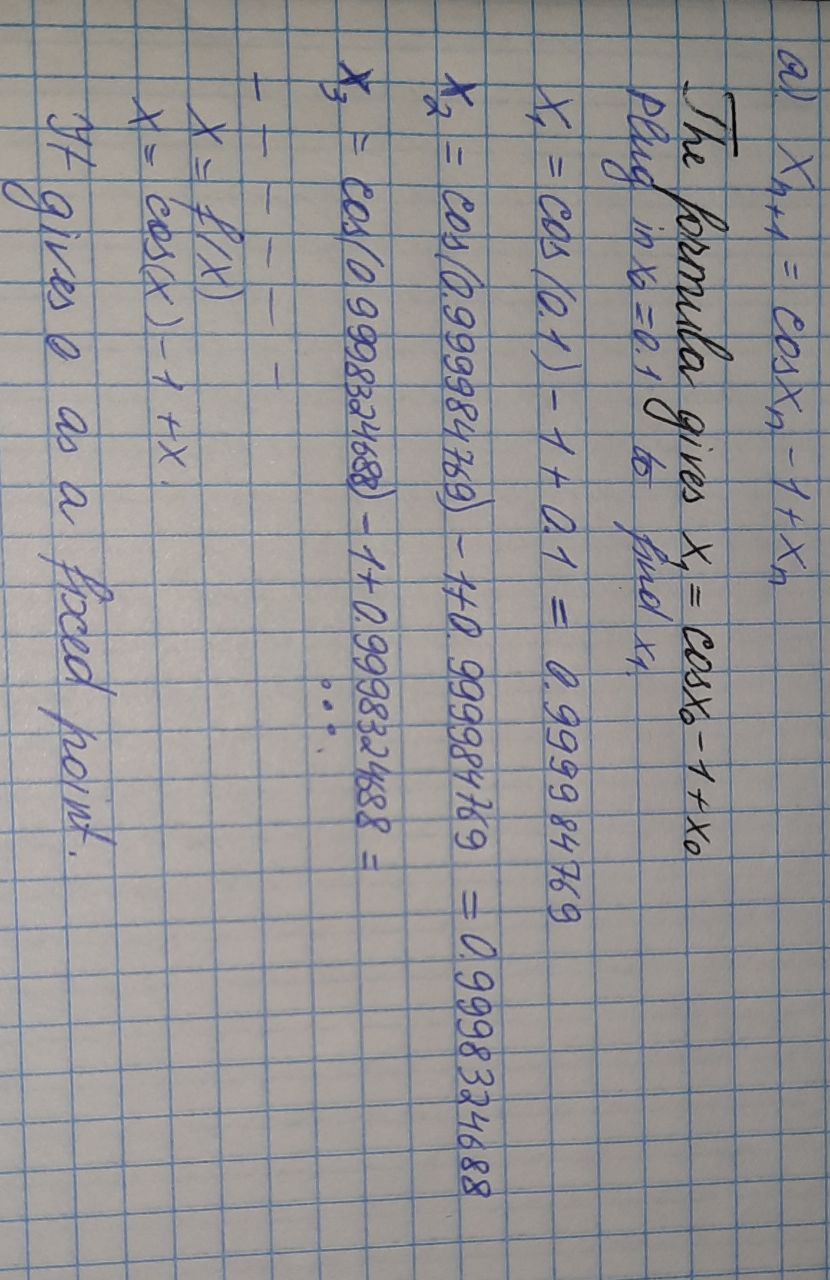
It tends to 2 . It is quadratic.

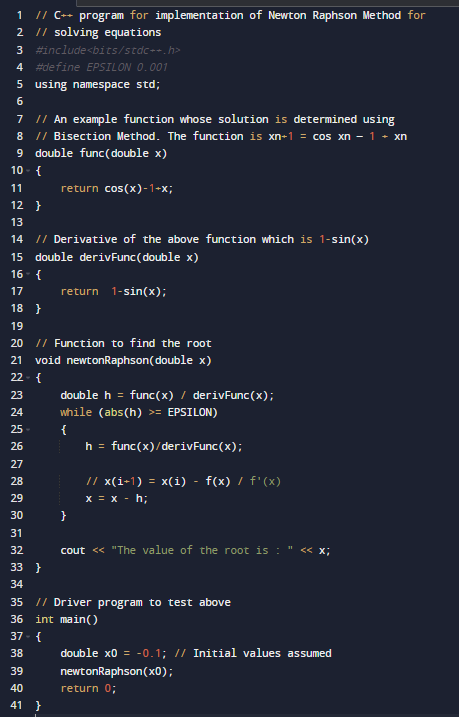
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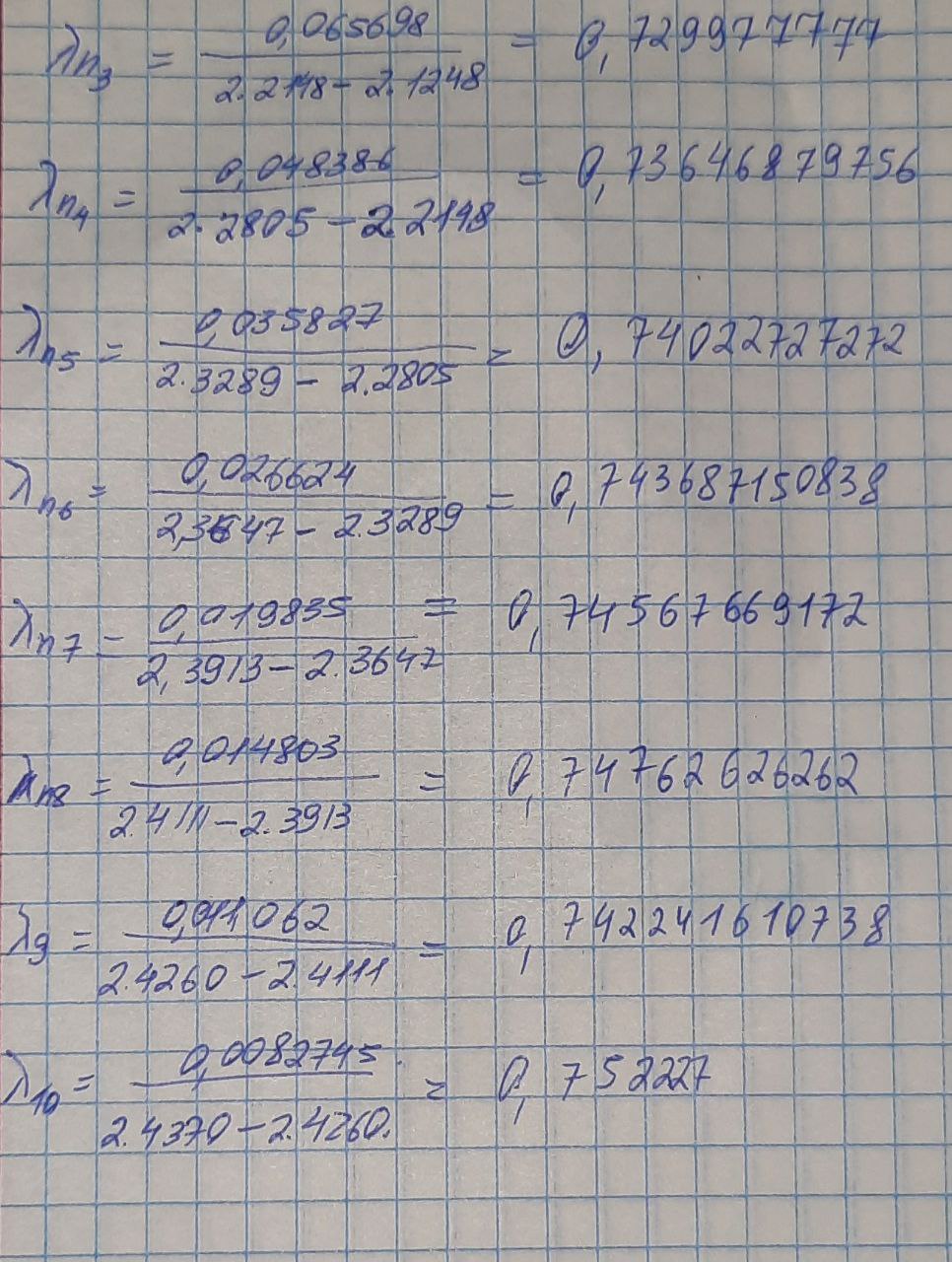
**Ex.5**

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**Ex.6**

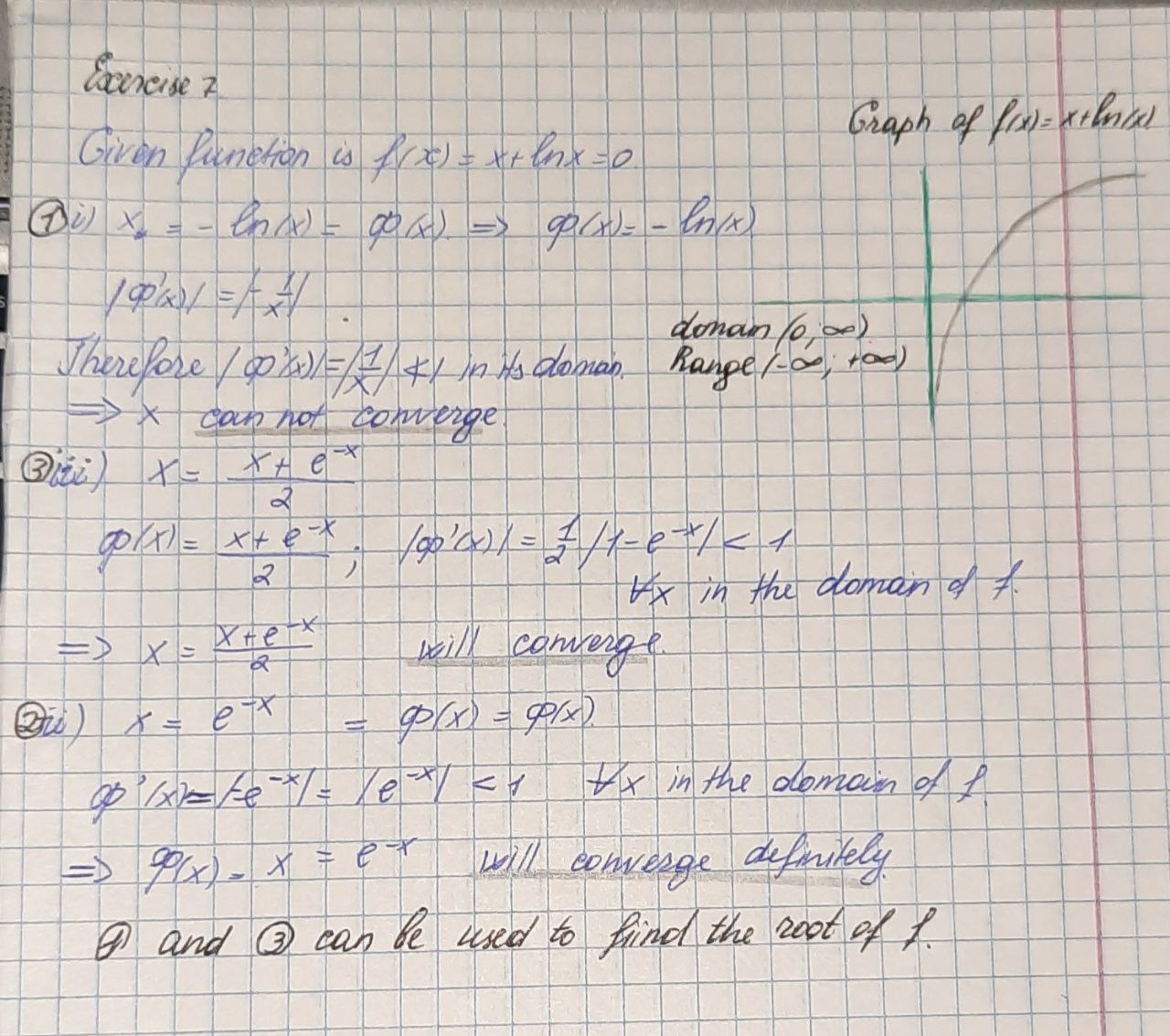
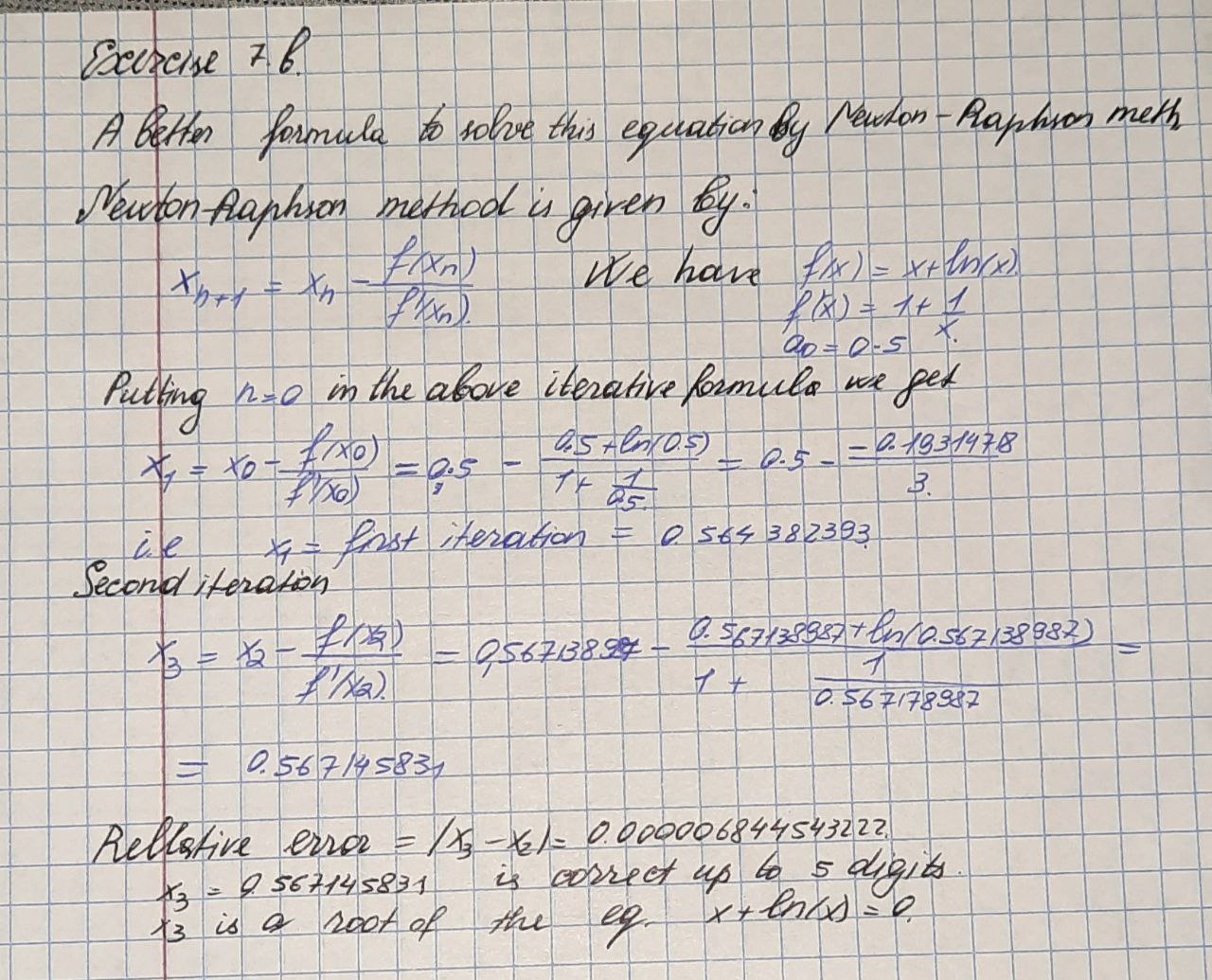
|  |  |  |  |
| --- | --- | --- | --- |
| *n* | *xn* | *xn* − *xn−*1 | λn |
| 0 | 2*.*0 |  |  |
| 1 | 2*.*1248 | 0*.*124834 |  |
| 2 | 2*.*2148 | 0*.*089944 | 0,720705 |
| 3 | 2*.*2805 | 0*.*065698 | 0.72997777 |
| 4 | 2*.*3289 | 0*.*048386 | 0.736468797 |
| 5 | 2*.*3647 | 0*.*035827 | 0,74022727272 |
| 6 | 2*.*3913 | 0*.*026624 | 0.74567669172 |
| 7 | 2*.*4111 | 0*.*019835 | 0.74567669172 |
| 8 | 2*.*4260 | 0*.*014803 | 0,747626262 |
| 9 | 2*.*4370 | 0*.*011062 | 0,74224161073 |
| 10 | 2*.*4453 | 0*.*0082745 | 0,752227 |

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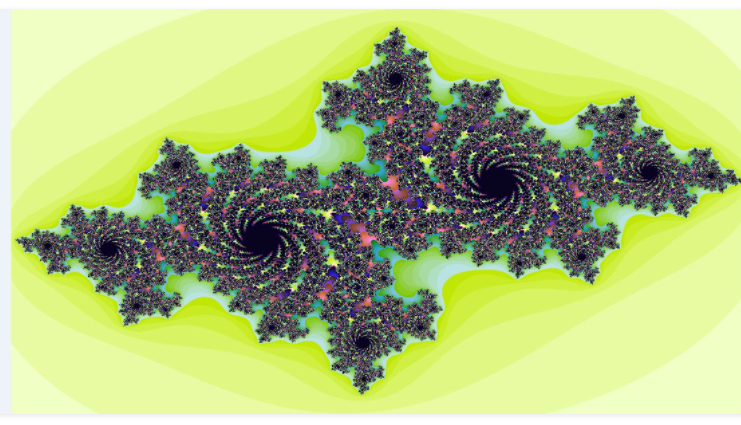
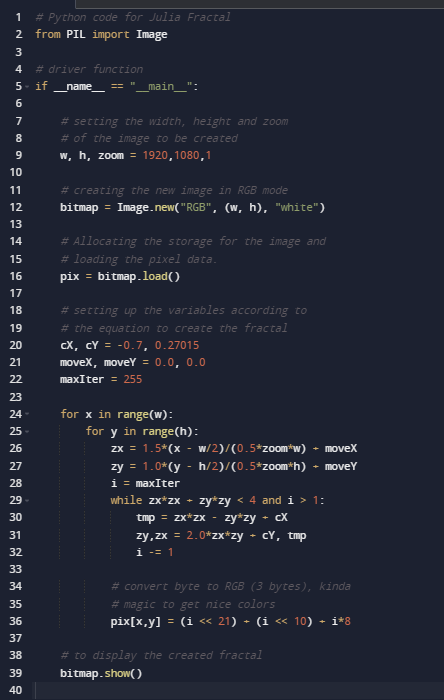
a)An iterative method is called convergent if the corresponding sequence converges for given initial approximations. Out function is convergent because it tends to the initial value 2.

b) Yes.

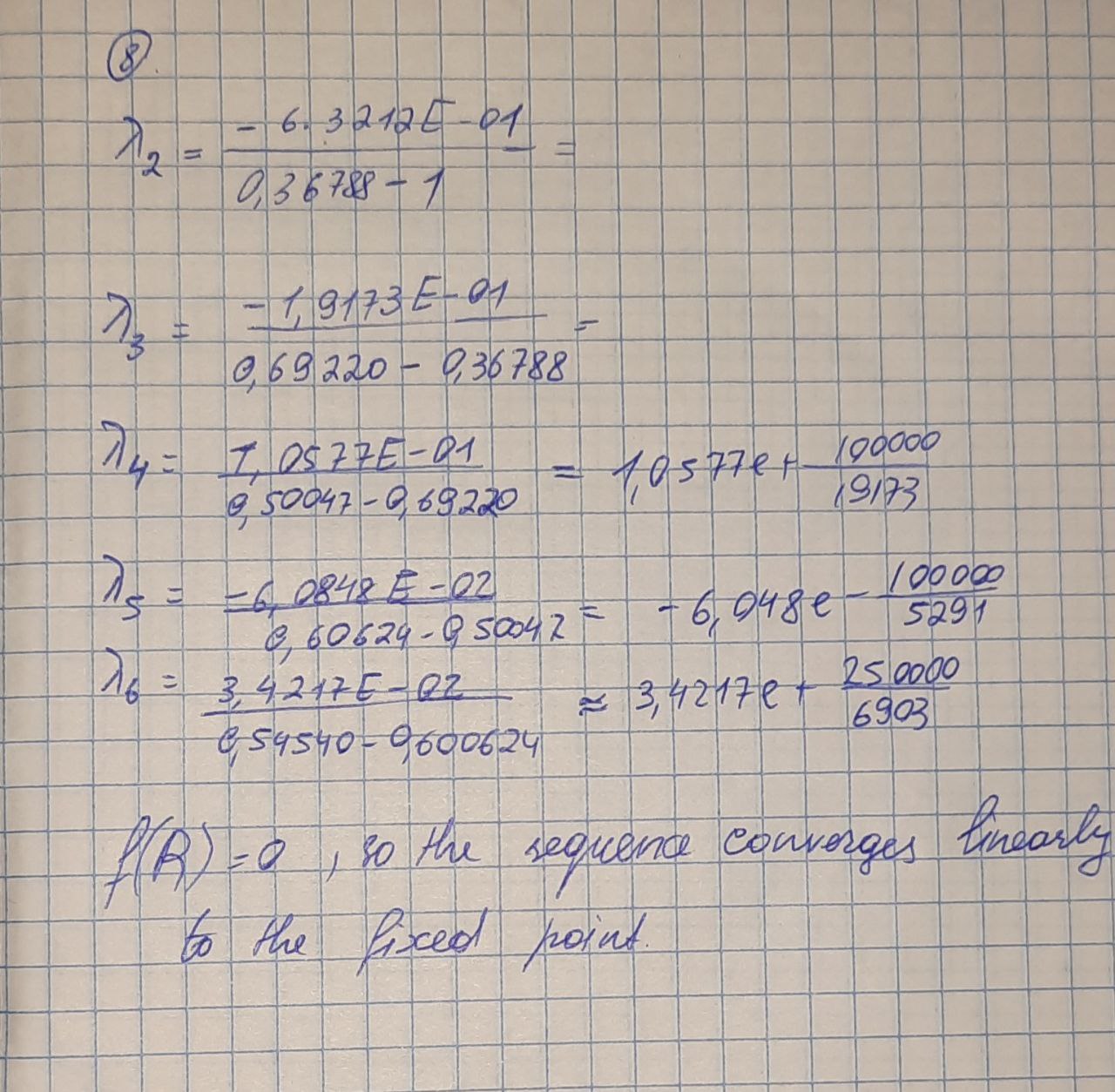
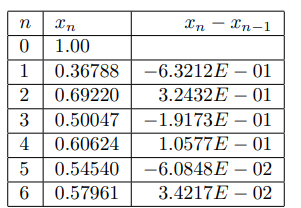
c) When the condition is satisfied, Newton's method converges, and it also converges faster than almost any other alternative iteration scheme based on other methods of coverting the original f(x) to a function with a fixed point.

**Ex.7**

**Ex.9**

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**Ex.8**

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We can also use Aitken extrapolation formula