2. $f(z) = e^{-15z} - z + \cos(z)$

$z = e^{-15z} + \cos(z)$

$z_{i+1} = e^{-15z_i} + \cos(z_i)$

Initial guess value = 0.1

1st Iteration $\Rightarrow z_{i+1} = e^{-15(0.1)} + \cos(0.1)$

$= \cancel{0.223 + 0}$

$= 1.223128637$

2nd $\Rightarrow z_{i+1} = e^{-15(1.223)} + \cos(1.223)$

$= 0.9997724589$

3rd $\Rightarrow z_{i+1} = e^{-15(0.99977)} + \cos(0.99977)$

$= 0.9998480715$

4th $\Rightarrow z_{i+1} = e^{-15(0.99985)} + \cos(0.99985)$

$= 0.999848048$

5th $\Rightarrow z_{i+1} = e^{-15(0.999848048)} + \cos(0.999848048)$

$= 0.999848048$

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$$\text{Error} = \frac{Z_{i+1} - Z_i}{Z_{i+1}} \times 100$$

For 1st iteration $\Rightarrow \frac{1.223 - 0.1}{1.223} \times 100 = 91.82$

2nd $\Rightarrow \frac{0.9997722069 - 1.223}{0.9997722069} \times 100 = -22.34$

3rd $\Rightarrow \frac{0.9998480715 - 0.9997722069}{0.9998480715} \times 100 = 0.00759$

4th $\Rightarrow \frac{0.9998497047 - 0.9998480715}{0.9998497047} \times 100 = -2.35 \times 10^{-6}$

5th $\Rightarrow \frac{0.9998497047 - 0.9998497047}{0.9998497047} \times 100 = 0$

Iter	Z	Error
0	~~1.22312~~ 0.1	0
1	~~0.999778~~ 1.223128637	91.82
2	0.9997722069	+22.34
3	0.9998480715	0.00759
4	0.9997497047	$+2.35 \times 10^{-6}$
5	0.9998497047	

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