

Math Lab Code

Command window

clear

clc

format long g

V = 0.5

for i = 1:100

$$V(i+1) = \sqrt[5]{((500 + C \log(CV(i))))^3 * (34.3 + C * 0.020 * V(i)))} / 0.3$$

$$Ea(i+1) = \text{abs}((CV(i+1) - V(i)) / V(i)) * 100;$$

if Ea(i+1) <= 1E-11

break

end

[iter 'V' 'Ea']

plot [V, iter

axis tight

grid on

grid minor

Iter	V	Ea
0	0.5	0
1	239.05	99.791
2	294.17	18.736
3	302.16	2.7895
4	303.85	0.4099
5	304.04	0.060753
6	304.06	0.0088241
7	304.07	0.0012944
8	304.07	0.0012944
9	304.07	0.9635e ⁻¹²

Converges at iter = 7, give $V = 304.07$

∴ the Converging value is seen to be 304.07

$$T_d = \frac{0.3V^2}{50 + (\ln V)^3} - 0.02V$$

If $V = 304.07$

$$\begin{aligned} Y_e, T_b &= 9.8 \times 3.8 \approx 34.3 \\ &= \frac{0.3 \times (304.07)^2}{50 + (\ln 304.07)^3} - 0.02(304.07) \\ &= 34.25 \approx 34.3 \end{aligned}$$