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17/ECE602/012
Computer Engineering

ENG 382

Command Window

Clear

Cle

format Short

V = 0.5

M = 3.5

A = 9.8

F = m * g

$$N = \text{Sqrt}((C(F + (0.02 * V))) * ((\log(V) \wedge 3) + (10 * V) + 17.50) / 0.3);$$

for i = 1 : 10

iter(i+1) = i

$$N(i+1) = \text{Sqrt}((C(F + (0.02 * V(i)))) * (\log(V(i)) \wedge 3) + (10 * V(i) + 17.50) / 0.3)$$

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

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

break

end

end

table = table(iter, 'V', 'Ea')

Output

Iter	V	$\Sigma \epsilon$
0	0.5	0
1	239.05	99.791
2	294.17	18.736
3	302.61	2.7894
4	303.85	0.40992
5	304.04	0.060144
6	304.06	0.0088222
7	304.07	0.0012941
8	304.07	0.00018981
9	304.07	$2.7842e^{-05}$
10	304.07	$4.0838e^{-06}$
11	304.07	$8.7865e^{-08}$
12	304.07	$1.2888e^{-08}$
13	304.07	$1.8904e^{-09}$
14	304.07	$2.7727e^{-10}$
15	304.07	$4.0679e^{-11}$
16	304.07	$5.9635e^{-12}$

Converging out then = 7 ; $V = 304.07$

Prove

$$F_D = \frac{0.3V^2}{500 + (\ln V)^3} - 0.02V$$

$$\text{If } V = 304.07$$

$$\text{Recall } F_D = 9.8 \times 3.5 = 34.30$$

Substituting $V = 304.07$

$$F_D = \frac{0.3 \times (304.07)^2}{500 + (\ln(304.07))^3}$$

$$= 0.02(304.07)$$

$$= 6.0814$$

$$F_D = 40.38195931 - 6.0814$$

$$F_D = 34.3$$