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17/ENG 03/024

Civil Engineering

ENG 382 Assignment 1 Solution

8

Common Window

Clear

Clc

format short

V = 0.9

m = 3.9

g = 9.8

F = m * g

v = sqrt(((F + (0.02 * v)) * (log cv)^3) + (10 * v) + 17150) / 0.3;

for i = 1:10f

iter(i+1) = i

v(i+1) = sqrt(((F + (0.02 * v(i))) * (log cv(i))^3) + (10 * v(i)) + 17150) / 0.3);

Ea(i+1) = abs((v(i+1) - v(i)) / v(i+1)) * 100);

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

break

end

end

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

Output

iter	v	Ea
0	0.9	0
1	239.05	99.791
2	294.17	18.736
3	302.61	2.7894
4	303.85	0.40992

5	304.04	0.000144
6	304.06	0.0088222
7	304.07	0.0012941
8	304.07	0.00018981
9	304.07	2.782e-05
10	304.07	4.0888e-06
11	304.07	8.7865e-08
12	304.07	1.2888e-08
13	304.07	1.8904e-09
14	304.07	2.727e-10
15	304.07	4.0679e-11
16	304.07	5.9635e-12

Converging of iter = 7; $V = 304.07$

Prove

$$f_A = 0.3v^2 \quad 0.02v$$

$$500 + (inV)^3$$

$$If V = 304.07$$

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

Substituting $v = 304.07$

$$f_A = 0.3 \times (304.07)^2$$

$$500 + (in(304.07))^3$$

$$f_A = 40.38195931 - 6008.14$$

$$f_A = 34.3$$