

EJUNEATSE TOSAN DORCAS.

17/ENG06/029.

Mechanical Engineering.

ENG 382.

Assignment.

command window

clear

clc.

format short.

v = 0.5.

m = 3.5.

g = 9.8.

F = m \* g.

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

for i = 1 : Inf.

Iter(i+1) = i;

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

Er(i+1) = abs((v(i+1) - v(i)) \* 100);

if Er(i+1) <= 1E-11.

break

end

end.

Tableid = table('Iter', v', Er')

OUTPUT

iter	v	Er
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	0.00012941
8	304.07	0.00018981
9	304.07	$2.7842e^{-06}$
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 at iter = 7  $v = 304.07$

Prove

$$F_D = 0.3v^2 - 0.02v$$

$$500 + (inv)^3$$

if  $v = 304.07$

$$F_D = 9.8 \times 3.5 = 34.30$$

substituting  $v = 304.07$

$$F_D = \frac{0.3 \times (304.07)^2}{500 + (inv(304.07))^3} - 0.02(304.07)$$

$$F_D = 40.38195931 - 600814$$

$$F_D = 34.3$$