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ENR 382 ASSIGNMENT

```

Command window
clear
clc
format short
v=0.5
m=3.5
g=9.8
F=m*g
v = sqrt(((F + (0.02 * v))^8 * ((log(v))^8)) + (10 * v) + (17(50/0.3)));
for i = 1:m
    iter(i) = i
    v(i) = sqrt(((F + (0.02 * v(i))^8 * ((log(v(i)))^8)) + (10 * v(i)) + (17(50/0.3)));
    Ra(i) = abs(((v(i) - v(i-1))) / v(i)) * 100);
    if Ra(i) <= 1e-11
        break
    end
end
end
table = table(iter, 'v', Ra)
  
```

OUTPUT

iter	v	Ra
0	0.5	0
1	289.05	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	2.7842 e ⁻⁰⁵
10	304.07	4.0838 e ⁻⁰⁶
11	304.07	8.7865 e ⁻⁰⁸

12	804.07	$1.2888 e^{-08}$
13	804.07	$1.3904 e^{-09}$
14.	804.07	$2.7727 e^{-10}$
15	804.07	$4.6679 e^{-11}$
16	804.07	$5.9635 e^{-12}$

Convergence of iter = 7; $V = 804.07$

Prove

$$\bar{F}_D = 0.3V^2 - 0.62V$$

$$500 + (\ln V)^3$$

$$\text{if } V = 804.07$$

$$\text{Recall } F_D = 9.8 \times 8.5 = 84.80$$

$$\text{Substituting } V = 804.07$$

$$\bar{F}_D = \frac{0.3 \times (804.07)^2}{500 + (\ln(804.07))^3} - 0.62(804.07)$$

$$\therefore \bar{F}_D = 46.38195981 - 6.00819$$

$$\therefore \bar{F}_D = 84.311$$