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MATRIC NO.: 16/ENG04/058

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

$$F_d = mg$$

$$F_d = 3.5 \times 9.8 = 34.3$$

$$\frac{0.3v^2}{500 + (\ln v)^3} - 0.02v = 34.3$$

$$\frac{0.3v^2}{500 + (\ln v)^3} - 0.02v - 34.3 = 0$$

$$0.3v^2 = (0.02v + 34.3)(500 + (\ln v)^3)$$

$$V = \left(\frac{(0.02v + 34.3)(500 + (\ln v)^3)}{0.3} \right)^{\frac{1}{2}}$$

MATLAB SOLUTION

```
commandwindow
clear
clc
close all
format short g
v=0.5;
for i=1:inf
    iter(i+1)=i;
    v(i+1)=(((0.02*v(i))+34.3)*(500+(log(v(i)))^3))/0.3)^(1/2)
    Ea(i+1)=abs((v(i+1)-v(i))/v(i+1))*100
    if Ea(i+1)<=1E-11
        break
    end
end
end
grace=[iter' v' Ea']
```

ans:

grace =

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	5.9902e-07
12	304.07	8.7865e-08
13	304.07	1.2888e-08
14	304.07	1.8904e-09
15	304.07	2.7729e-10
16	304.07	4.066e-11
17	304.07	5.9822e-12