Command window

```
Clear
Clc
format short
V = 0.5
m = 3.5
g = 9.8
F = m*g
V = sqrt((((((F + (0.02*V)(((log(M)^3)) + 10*V) + 17150)/0.3);
for i = 1:inf
iter(i+1) = i
v(i+1) = sqrt((((F + 0.02*v(i)))*((log v(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-4
    break
end
end
table = table(iter,'v', Ea')
```

OUTPUT

| Iter | V | Ea |
|---|---|---|
| 0 | 0.0 | 0 |
| 1 | 239.05 | 99.701 |
| 2 | 294.47 | 18.436 |
| 3 | 302.61 | 2.7894 |
| 4 | 303.85 | 0.40092 |
| 5 | 304.04 | 0.060144 |
| 6 | 304.06 | 0.0083222 |
| 7 | 304.07 | 0.001294 |
| 8 | 304.07 | 0.00018981 |
| 9 | 304.07 | $2.7842 \times 10^{-05}$ |
| 10 | 304.07 | $4.0838 \times 10^{-06}$ |
| 11 | 304.07 | $8.7865 \times 10^{-08}$ |
| 12 | 304.07 | $1.2888 \times 10^{-08}$ |
| 13 | 304.07 | $1.8904 \times 10^{-09}$ |
| 14 | 304.07 | $2.7727 \times 10^{-10}$ |
| 15 | 304.07 | $4.0679 \times 10^{-11}$ |
| 16 | 304.07 | $5.9635 \times 10^{-12}$ |

Convergence at iter = 7; V = 304.07

Proof

$$F_D = \frac{0.3V^2}{500 + (1.1V)^3} - 0.02V \quad \text{---} \quad (1)$$

If V = 304.07

Accel $F_A = C_1 = 9.81 \times 3.5 = 34.30 N$

Substituting V = 304.07 into eqn (1)

$$\therefore F_D = \frac{0.3(304.07)^2}{500 + (1.1(304.07))^3} - 0.02(304.07)$$

$$F_D = 40.381495131 - 6.0814$$

$$F_D = 34.3 N$$