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30DLVL

Answer

MATLAB

Command window

```
clear all
```

```
clc
```

```
format long g
```

```
N = 0.5;
```

```
m = 3.5;
```

```
a = 9.8;
```

```
F = m*a;
```

```
V = Sqrt((Cf + 0.02*v)) * (log(v)^3) + (10*v) + 17150 / 0.3;
```

```
for i = 1:20
```

```
iter(i) = i
```

```
V(i+1) = Sqrt(((Cf + 0.02 * V(i))) * (log(V(i)))^3 + (10 * V(i)) + 17150) / 0.3);
```

```
error(i+1) = abs((V(i+1) - V(i)) / V(i+1) * 100);
```

```
if error(i+1) <= 1E-11
```

```
break
```

```
end
```

```
end
```

```
Uju Uju = table (iter, V, error)
```

Note; from MATLAB, the output; the terminal velocity is the convergence which is;

$$V = 304.067$$

To check;

$$F_0 = \frac{0.3 V^2}{500 + (\ln V)^3} - 0.02 V$$

$$= \frac{0.3 (304.067)^2}{500 + (\ln(304.067))^3} - 0.02 (304.067)$$

$$= 34.299$$

$$\underline{\underline{34.3}}$$

$$F_0 = ma$$

$$= 9.8 \times 3.5$$

$$= 34.5$$

It has been proved.