Equações Usadas

Velocidade em função do tempo

$$v(t) = -v_{term}(1 - e^{\frac{-t}{\tau}})$$

Aceleração em função do tempo

$$a(t) = \frac{-v_{term}}{\tau}.e^{\frac{-t}{\tau}}$$

Posição em função do tempo

$$y(t) = -v_{term}t - v_{term}\tau.e^{\frac{-t}{\tau}} + C$$

```
import numpy as np
def s(t):
   return -25*(t+5*np.exp(-t/5))+125
def v(t):
    return -25*(1-np.exp(-t/5))
def a(t):
    return -4*np.exp(-t/5)
elementos=np.zeros((4,21))
i=0
for t in np.arange (0,10.5,0.5):
    elementos[0][i]=t;        elementos[1][i]=s(t);    elementos[2][i]=v(t);
    print(t,s(t),v(t),a(t))
```

```
0.0 0.0 -0.0 -4.0
0.5 -0.6046772544949306 -2.3790645491010123 -3.619349672143838
1.0 -2.341344134747743 -4.531731173050455 -3.2749230123119273
1.5 -5.102277585214722 -6.479544482957053 -2.9632728827268715
2.0 -8.79000575445491 -8.241998849109017 -2.6812801841425573
2.5 -13.316332464079181 -9.836733507184164 -2.4261226388505337
3.0 -18.601454511753303 -11.27970909764934 -2.1952465443761056
3.5 -24.573162973926173 -12.585367405214761 -1.986341215165638
4.0 -31.166120514652675 -13.766775897069461 -1.7973158564688863
4.5 -38.32120746757491 -14.835758506485023 -1.6262786389623964
5.0 -45.984930146430315 -15.803013970713941 -1.4715177646857693
5.5 -54.108885462259934 -16.67822290754801 -1.3314843347923182
6.0 -62.64927648902528 -17.470144702194943 -1.2047768476488085
6.5 -71.56647412925156 -18.186705174149687 -1.0901271721360504
7.0 -80.82462049270083 -18.835075901459838 -0.986387855766426
7.5 -90.39127001855371 -19.421745996289257 -0.8925206405937193
8.0 -100.23706474933195 -19.952587050133616 -0.8075860719786215
8.5 -110.33544050659185 -20.43291189868163 -0.7307340962109387
9.0 -120.66236102769832 -20.867527794460337 -0.6611955528863461
9.5 -131.19607740282942 -21.26078451943412 -0.5982744768905403
10.0 -141.91691040457658 -21.616617919084682 -0.5413411329464508
```

https://colab.research.google.com/drive/15Ts4bfcyuzWd6OvXM2gKOXukS9KLtQ1y?usp=sharing

✓ 0s conclusão: 22:03