

```

>
restart;

#####
# Maple-Worksheet zu Übungsblatt 4, Aufgabe 1 b) und c)
#####

>
# Fischadler + Fisch.

# x-Koordinate der Bahnkurve.
x := -(m*v_0/alpha) * (exp(-(alpha/m)*t) - 1);

# y-Koordinate der Bahnkurve.
y := -(m^2*g/alpha^2) * (exp(-(alpha/m)*t) - 1) - (m*g/alpha)*t
+ h;

plot(subs(m=0.2, g=9.81, alpha=0.1, h=13.0, y), t=0.0..2.0);

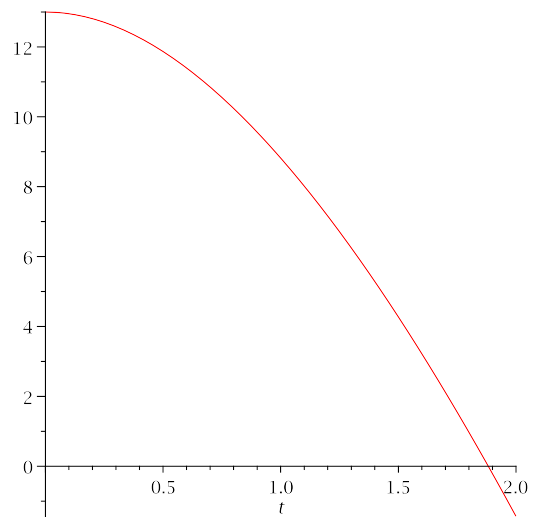
# Numerische Lösung der Gleichung y(t)=0.
solve(subs(m=0.2, g=9.81, alpha=0.1, h=13.0, y)=0, t);

evalf(subs(alpha=0.1, v_0=10.0, m=0.2, t=1.882, x));

```

$$x := -\frac{m v_0}{\alpha} \left( e^{-\frac{\alpha t}{m}} - 1 \right)$$

$$y := -\frac{m^2 g}{\alpha^2} \left( e^{-\frac{\alpha t}{m}} - 1 \right) - \frac{m g t}{\alpha} + h$$



1.882187591, -1.434029478  
12.19525194

(1)

```

>
# Flugzeug + Paket.

# Stärke der Reibungskraft.
alpha_ := 80.0 * 9.81 / (280.0 * 1000 / 3600);

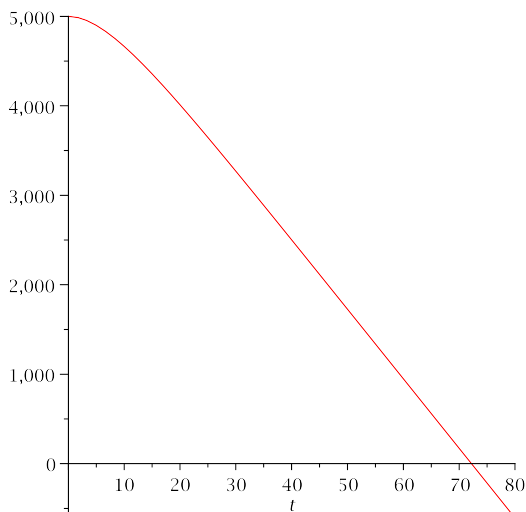
plot(subs(m=80.0, g=9.81, alpha=alpha_, h=5000.0, y), t=0.0..80.0);

# Numerische Lösung der Gleichung y(t)=0.
solve(subs(m=80.0, g=9.81, alpha=alpha_, h=5000.0, y)=0, t);

evalf(subs(alpha=alpha_, v_0=500.0 * 1000 / 3600, m=80.0, t=72.21, x));

```

$\alpha := 10.09028571$



72.21325384, -19.40206373  
1101.047113

(2)

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