Probleem 1:

(a) Ons soek die waarde van t wat so is dat $y(t) = 0$, dws

$$-gt + \Big(\frac{c\,v_0\,\sin\theta + g}{c}\Big)\Big(1 - e^{-ct}\Big) = 0.$$

Met die gegewe waardes $v_0 = 200$ m/s, $\theta = \frac{\pi}{3}$ en $c = \frac{1}{450}$, soek ons dan vir t sodat

$$-9.81\,t = \frac{\frac{1}{450}\,200\,\sin(\frac{\pi}{3}) + 9.81}{\frac{1}{450}}\Big(1 - e^{-\frac{t}{450}}\Big) = 0$$

```
>> T = fzero(inline('-9.81*t+450*(1/450*200*sin(pi/3)+9.81)*(1-exp(-t/450))'),30)

T =

   34.8619
```

Dus, die projektiel is vir $t = T = 34.8619$ sekondes in die lug.

(b) Stel $t = T = 34.8619$ sekondes in die uitdrukking vir $x(t)$ om te kry

```
>> th = pi/3; c = 1/450;
>> xT = 200*cos(th)*(1-exp(-c*T))/c

xT =

   3.3546e+03
```

Dus is die reikafstand van die projektiel 3354.6 meter.

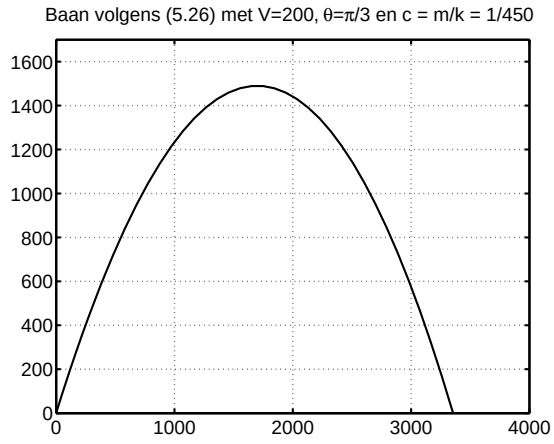
Probleem 2:

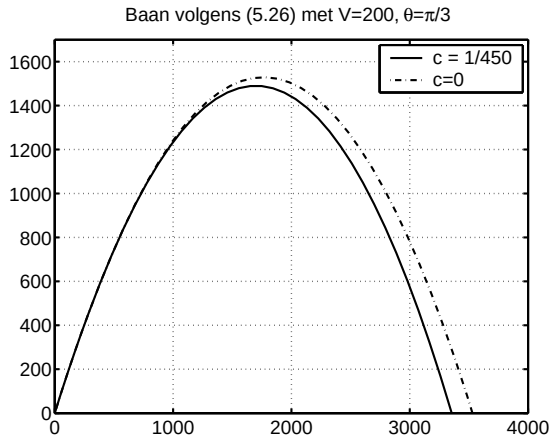
```
function f = proj(t, z);

% Funksie wat regterkant van projektielprobleem bereken

c = 1/450;
x = z(1); y = z(2); v = z(3); w = z(4);
f = [v; w; -c*v; -c*w-9.8];
```

(a) en (b)





(b) Vir $c = 1/450$ is die reikafstand 3354 meter, terwyl vir $c = 0$ is dit 3530 meter.

(c) $\approx 46^o$