Løsning Øv 8

MATLAB løsning:

```
% Oving 8
clear all
delta=18000e3;
KM=8.52;
KG0=8.05;
yG0=0;
T=7.7;
rho_s=1025;

mi=[delta 300e3 200e3 -100e3];
zi=[KG0   7.55  8.25  9];
yi=[yG0     -9     6.5   8];

zG=(mi*zi')/sum(mi)
yG=(mi*yi')/sum(mi)

% Task a) Small angle assumption
GM=KM-zG;
phi_a=atand((yG-yG0)/GM)*(-1)  %  Positive starboard

% Task b) Large angles of heel, use given KY(psi) values
phideg=[0 7.5  15   30   45   60   75];
KY =   [0 1.12 2.21 4.40 6.43 7.38 7.65];
GZ=KY-zG*sind(phideg)
k=abs(yG-yG0)*cosd(phideg) % Heeling moment arm in waterplane
reference frame

figure(1)
plot(phideg, GZ,'bx-', phideg,k,'ro-')    %, psidegi,ki,'ro--')

% Task c - interpolate with nonlinear smooth points
phideg_i=0:0.1:75;
GZi=spline(phideg,GZ,phideg_i);
ki=spline(phideg,k,phideg_i);

% plot interpolated points
figure(2)
plot(phideg, GZ,'bx-',phideg_i, GZi,'k-',...
    phideg,k,'ro-',phideg_i, ki,'k--')
xlabel('\Phi [deg]')
ylabel('GZ [m]')

ind=find((ki-GZi)<=0.0001);
%ind=find(GZi>=ki);

phi_equilibrium=phideg_i(ind(1)) % Heel angle
phi_capsize=phideg_i(ind(end))
```