4F2 CW1 Report notebook

1)

i) $G = \frac{c_p}{ms^2 + c_v s + c_p}$

$G_{\text{nom}} = \frac{1}{s^2 + s + 1}$

gain margin = ∞

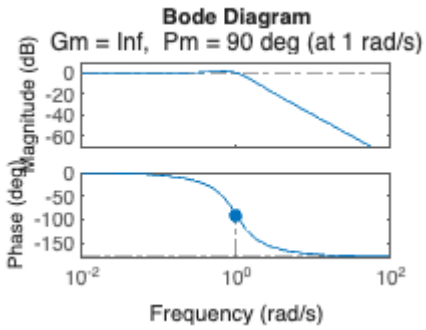
phase margin = 90°

any gain k > -1 guarentees stability due to nyquist stability criterion

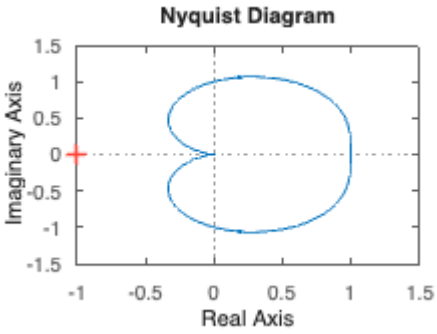
```
m=1;
cp=1; % +-0.075
cv=1; % +-0.1

G_nom = tf(cp, [m, cv, cp]);

% bode(G_nom);
margin(G_nom)
```




```
nyquist(G_nom);
```




```
% rlocus(G_nom);
```

ii)

since *Enter your equation.*

```
omega = 2*pi*1e5;
d = tf(omega, [1, 0, omega^2]);

% step = tf(1, [1, 0]);
for k=0.1:0.1:0.9
    % y = -((k*G_nom)/(1+k*G_nom))*d;
    step(((k*G_nom)/(1+k*G_nom)));
    hold on;
end
```