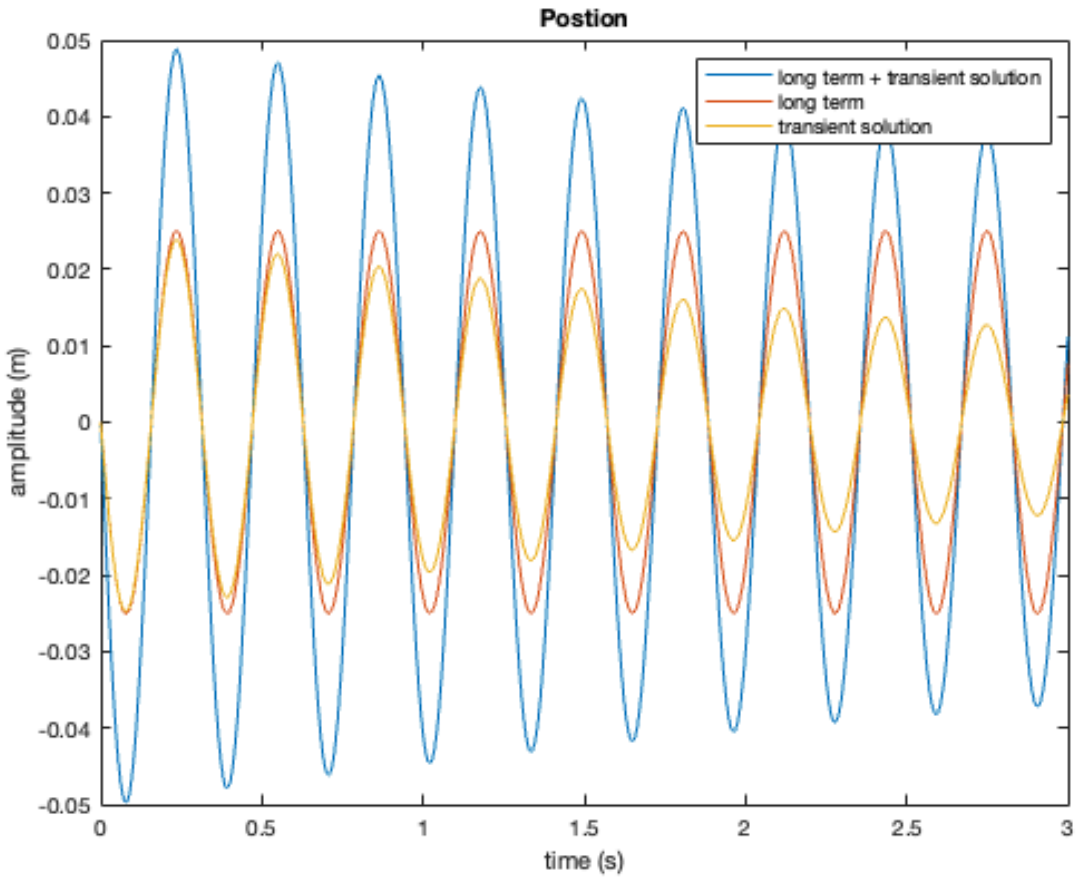
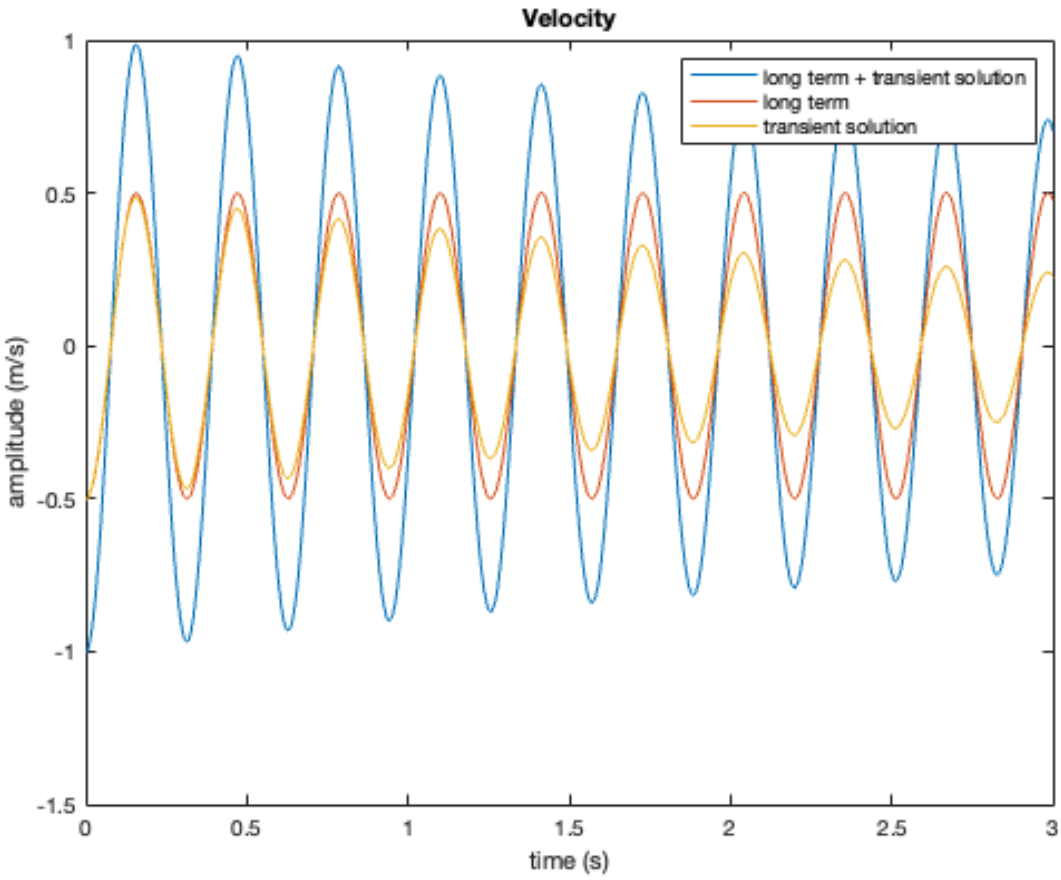
```
close all; clear all; clc;
C = 1/39.6;
A = 1/40;
gamma = 1/2;
theta = pi/2;
phi = pi/2;
wd = 20;
t= linspace(0,3,10000);
w = 20;


x_h = C*exp(-gamma/2.*t).*cos(wd*t+theta);
x_i = A*cos(t.*w+phi);
x = x_h+x_i;

v_h = -gamma/2*C*exp(1).^(-gamma/2.*t).*cos(wd.*t+theta)-wd.*C.*exp(1).^(-
gamma/2.*t).*sin(wd.*t+theta);
v_i =-A.*wd.*sin(wd.*t+phi);
v_total =  -gamma/2*C*exp(1).^(-gamma/2.*t).*cos(wd.*t+theta)-
wd.*C.*exp(1).^(-gamma/2.*t).*sin(wd.*t+theta)-A.*wd.*sin(wd.*t+phi);



figure()
plot(t,x,t,x_i,t,x_h)
xlabel('time (s)')
ylabel('amplitude (m)')
legend('long term + transient solution','long term','transient solution')
title('Postion')

figure()
plot(t,v_total,t,v_i,t,v_h)
xlabel('time (s)')
ylabel('amplitude (m/s)')
legend('long term + transient solution','long term','transient solution')
title('Velocity')
```


Postion
long term + transient solution
long term
transient solution
amplitude (m)
time (s)
0.05
0.04
0.03
0.02
0.01
0
-0.01
-0.02
-0.03
-0.04
-0.05
0
0.5
1
1.5
2
2.5
3



Published with MATLAB® R2022a