

Problem #0.16

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```

T=1;
Ts=T/100;
tmin=0;
tmax=1;
N=tmax/Ts;
n=-N:N;

omega1 = 0.005*pi;
omega2 = 0.05*pi;
omega3 = 0.5*pi;

figure();

subplot(3, 1, 1);
syms m1
yn1 = exp(-(n*Ts));
f1 = cos(omega1*m1*Ts)*exp(m1*Ts);
V1 = subs(f1, m1, n);
plot(n, yn1*sum(V1));
title('Omega = 0.005*pi')

subplot(3, 1, 2);
syms m2
yn2 = exp(-(n*Ts));
f2 = cos(omega2*m2*Ts)*exp(m2*Ts);
V2 = subs(f2, m2, n);
plot(n, yn2*sum(V2));
title('Omega = 0.05*pi')

subplot(3, 1, 3);
syms m3
yn3 = exp(-(n*Ts));
f3 = cos(omega3*m3*Ts)*exp(m3*Ts);
V3 = subs(f3, m3, n);
plot(n, yn3*sum(V3));
title('Omega = 0.5*pi')

% figure(2);
% a = 1:0;
% b = [Ts*cos(omega1) -(Ts-1)];
% y = filter(b, a, V1);
% plot(n, y);

syms y(t) x(t)
x(t) = cos(0.5*t)
ode = x(t) == diff(y, t) + y(t)
sol = dsolve(ode)

```

$x(t) =$

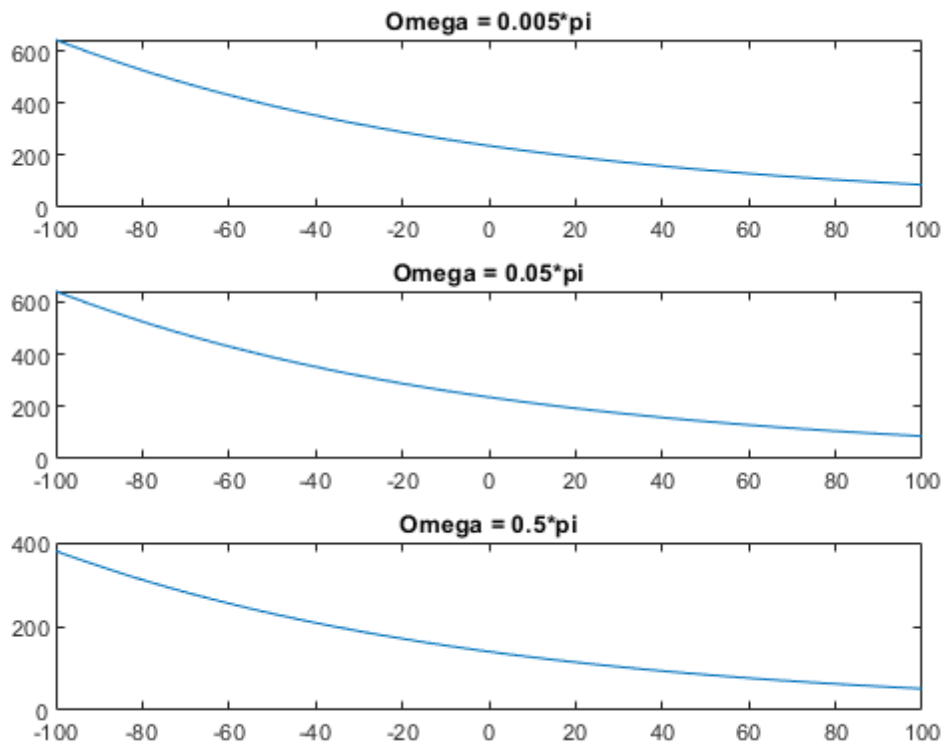
$\cos(t/2)$

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ode(t) =
```

```
cos(t/2) == diff(y(t), t) + y(t)
```

```
sol =
```

```
(2*5^(1/2)*cos(t/2 - atan(1/2)))/5 + C1*exp(-t)
```



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