

```
commandwindow
clear
clc

%4A
syms t y
Y= dsolve('D2y+5*Dy+6*y=cos(t)', 'y(0)=5', 'Dy(0)=3')
T=[0:0.1:50]
yn=subs(Y,T)
plot(T,yn)
grid on
grid minor
axis tight
figure (1)
```

```
%4B
syms T1 T2 t
E1 =('DT1+3*T2=exp(-2*t)')
E2 =('DT2-3*T1=exp(2*t)')
T1_initial=('T1(0)=30')
T2_initial=('T2(0)=30')
[T1,T2]=dsolve(E1,E2,T1_initial,T2_initial)
V=[0:0.1:5]
T1n=subs(T1,V)
T2n=subs(T2,V)
plot(V,T1n,V,T2n)
ylabel('Temperature')
xlabel('Time')
grid on
grid minor
axis tight
legend('T1','T2')
figure (2)
```

```
%4C
syms L I R E
y= dsolve('L*DI+R*I=E', 'I(0)=0')
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```
%4D
syms k a t w
y=k*exp(-a*t)*cos(w*t)
laplace(y)
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```
%4E
syms s
y=pi/(s^2+(10*pi*s)+(24*(pi^2)))
ilaplace(y)
```