```matlab
disp('1.');
syms y(t)
eqn=diff(y,t,2)+4*diff(y,t,1)+4*y==exp(-2*t); % differential squation
Dy=diff(y,t); % derivative
cond=[y(0)==0, Dy(0)==4];% initial conditions
ysol(t)=dsolve(eqn,cond)

disp('2.');
syms y(t)

eqn=diff(y,t,2)+y==sin(t);

Dy=diff(y,t);

cond=[y(0)==0, Dy(0)==4];

ysol(t)=dsolve(eqn,cond)

disp('3.');
syms y(t)

eqn=diff(y,t,2)-6*diff(y,t,1)+9*y==t*exp(3*t);

Dy=diff(y,t);

cond=[y(0)==0, Dy(0)==4];

ysol(t)=dsolve(eqn,cond)

disp('4.');
syms y(t)

eqn=diff(y,t,2)+2*diff(y,t,1)+10*y==-6*exp(-t)*sin(3*t);

Dy=diff(y,t);

cond=[y(0)==0, Dy(0)==1];

ysol(t)=dsolve(eqn,cond)

disp('5.');
syms y(x) z(x)

equations = [diff(y,x)+ diff(z,x) - 3*z == 0, diff(y, x, 2) + diff(z,x)== 0]

Dy =diff(y,x);

intitialConditions = [y(0)==0,Dy(0)==0, z(0)== 4/3];

[ySol, zSol] = dsolve(equations,intitialConditions)
```

1.

```
ysol(t) =

(exp(-2*t)*(t^2 + 8*t))/2

2.

ysol(t) =

(35*sin(t))/8 - sin(3*t)/8 - cos(t)*(t/2 - sin(2*t)/4)

3.

ysol(t) =

4*t*exp(3*t) + (t^3*exp(3*t))/6

4.

ysol(t) =

(exp(-t)*(sin(3*t) + sin(9*t) + 12*t*cos(3*t) - 2*cos(3*t)*sin(6*t)))/12

5.

equations(x) =

[diff(y(x), x) - 3*z(x) + diff(z(x), x) == 0, diff(y(x), x, x) + diff(z(x), x)
 == 0]


ySol =

x - exp(4*x)/4 + 1/4


zSol =

exp(4*x) + 1/3
```

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