```
>> syms x y t s
>> f=heaviside(t)+heaviside(t-1)*(t^2-1)+heaviside(t-3)*(sin(2*t)-t^2)

f =

heaviside(t) + heaviside(t - 3)*(sin(2*t) - t^2) + heaviside(t - 1)*(t^2 - 1)

>> ezplot(f,[0,10])

>>  syms x y t s Y
>> eqn=sym(['D(D(y))(t)+3*D(y)(t)+y(t)=heaviside(t)+heaviside(t-1)*(-2)+heaviside(t-2)']);
>> lteqn=laplace(eqn,t,s);
>> neweqn=subs(lteqn, {'laplace(y(t),t,s)','y(0)','D(y)(0)'},{Y,1,1});
>> ytrans=simplify(solve(neweqn,Y));
>> y=ilaplace(ytrans,s,t)

y =

2*heaviside(t - 1)*(exp(3/2 - (3*t)/2)*(cosh((5^(1/2)*(t - 1))/2) + (3*5^(1/2)*sinh((5^(1/2)*(t - 1))/2))/5)
- 1) - heaviside(t - 2)*(exp(3 - (3*t)/2)*(cosh((5^(1/2)*(t - 2))/2) + (3*5^(1/2)*sinh((5^(1/2)*(t - 2))/2))/5)
- 1) + exp(-(3*t)/2)*(cosh((5^(1/2)*t)/2) - (3*5^(1/2)*sinh((5^(1/2)*t)/2))/5) - exp(-
(3*t)/2)*(cosh((5^(1/2)*t)/2) + (3*5^(1/2)*sinh((5^(1/2)*t)/2))/5) + (8*5^(1/2)*exp(-
(3*t)/2)*sinh((5^(1/2)*t)/2))/5 + 1

>> ezplot(y,[0,5])
>>

>> syms x y t s Y
>> eqn=sym(['D(D(y))(t)+D(y)(t)+y(t)=dirac(t-1)']);
>> lteqn=laplace(eqn,t,s);
>> neweqn=subs(lteqn, {'laplace(y(t),t,s)','y(0)','D(y)(0)'},{Y,0,0});
>> ytrans=simplify(solve(neweqn,Y));
>> y=ilaplace(ytrans,s,t)

y =

(2*3^(1/2)*sin((3^(1/2)*(t - 1))/2)*heaviside(t - 1)*exp(1/2 - t/2))/3

>> ezplot(y,[0,12])
>>
```