```
%meleti tou genikou systimatos automatou elegxou 2hs taxis
%diatypwmenou stin typoiki morfi 1/(s^2+2*z*w0*s+w0^2)
%h analysi ayth isxyoun eite einai to systima eystathes anoiktou broxoy eite
einai
% kleistou broxou
%
clear all
syms w0 z t s y YM;
YM = 1/(s*(s^2+2*z*w0*s+w0^2));
y=ilaplace(YM,t);
y
simplify(y)

clear t y z w0; %gia na min exw tis idies metablites kai se symbolic logic
          %kai se kalsiko kwdika
telos=24;
t=[0:0.01:telos];
z=.15;w0=2;%syglinei
%z=-0.2;w0=2%apoklinei
D1=sqrt(1-z^2);%prosoxi 0<z<1
y=real(1/w0^2 - (cosh(t*w0*(z^2 - 1)^(1/2)) + (z*sinh(t*w0*(z^2 -
1)^(1/2)))./(z^2 - 1)^(1/2))./(w0^2*exp(t*w0*z)));
figure
plot(t,y)
pause
%%!!AKROTATA!!!
% MEGISTA GIA PERITA. ELAXISTA GIA ARTIA.
anw_fragma_lamda=floor(telos*w0*D1)/pi;
thesi_max=[1:2:anw_fragma_lamda]*pi/(w0*D1);
times_max=real(1/w0^2 - (cosh(thesi_max*w0*(z^2 - 1)^(1/2)) +
(z*sinh(thesi_max*w0*(z^2 - 1)^(1/2)))./(z^2 -
1)^(1/2))./(w0^2*exp(thesi_max*w0*z)));
hold on
plot(thesi_max,times_max,'r*')
plot(thesi_max(1),times_max(1),'mo')%thesi megistis yperypswsis
%telos megista
thesi_min=[2:2:anw_fragma_lamda]*pi/(w0*D1);
times_min=real(1/w0^2 - (cosh(thesi_min*w0*(z^2 - 1)^(1/2)) +
(z*sinh(thesi_min*w0*(z^2 - 1)^(1/2)))./(z^2 -
1)^(1/2))./(w0^2*exp(thesi_min*w0*z)));
hold on
plot(thesi_min,times_min,'k*')
%!!!  Telos akrotata!!%
%Teliki timi - monimi apokrisi einai to 1/w0^2.
monimi_apokrisi =1/w0^2
pososto_yperypswsis=100*((times_max(1)-monimi_apokrisi)/monimi_apokrisi)



%symfvna me ti thewreia, ta topika megista episbainoun gia t=lamda*pi/(W0*D1)
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