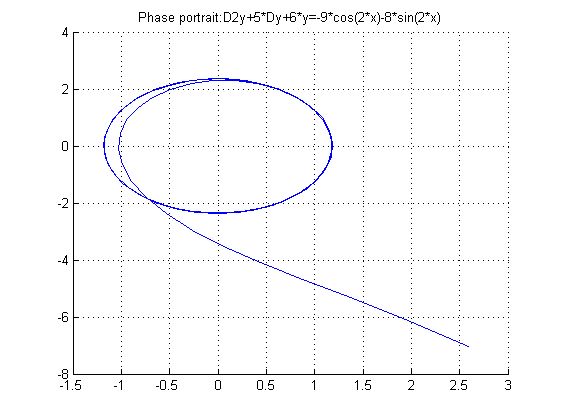
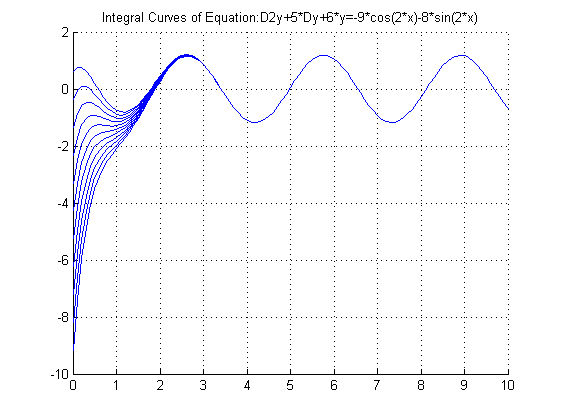
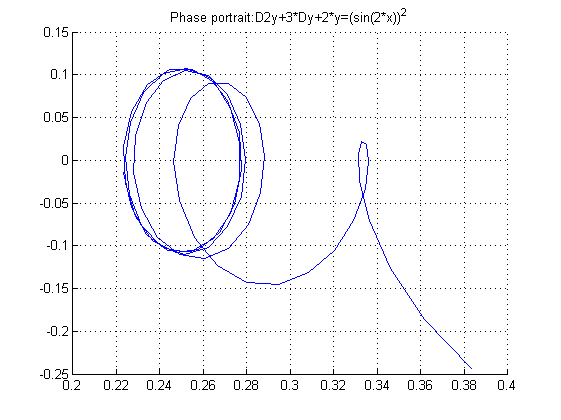
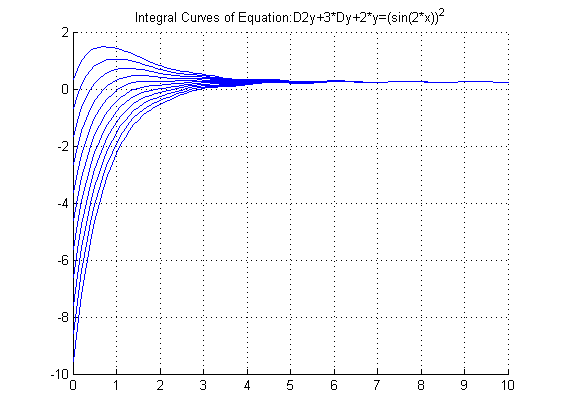
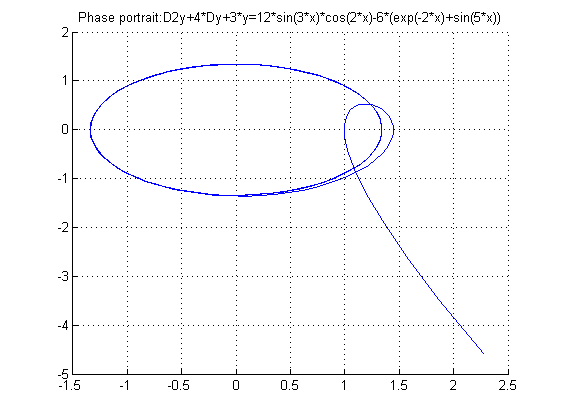
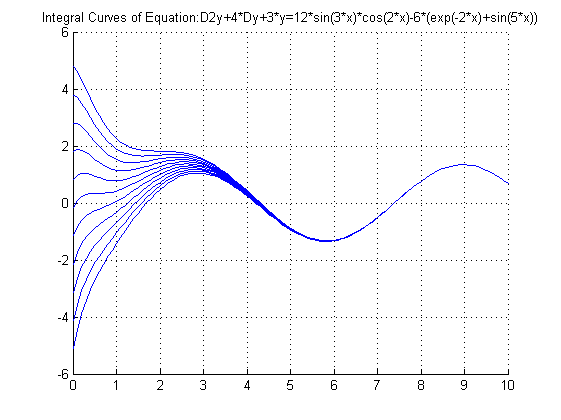
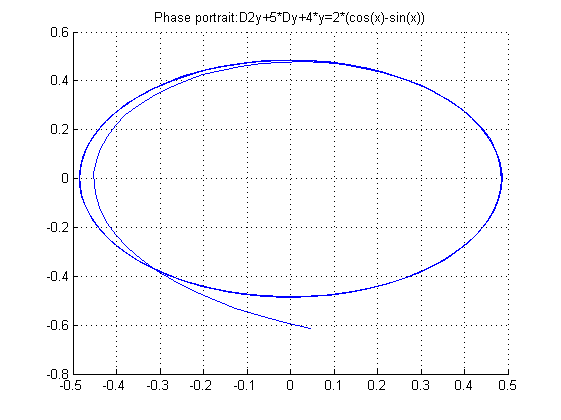
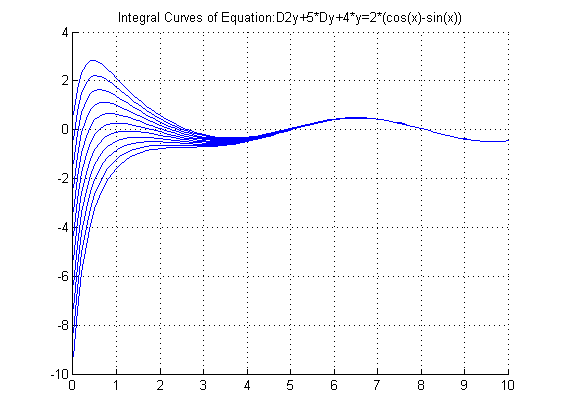
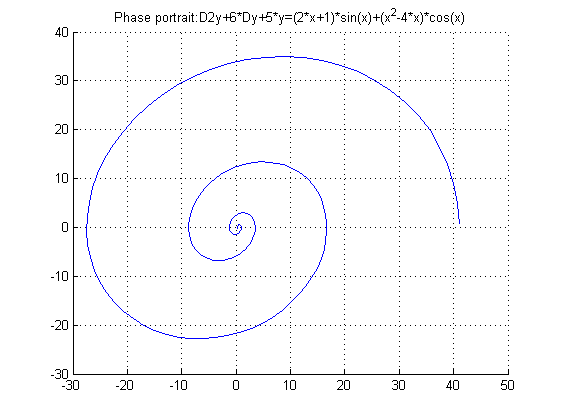
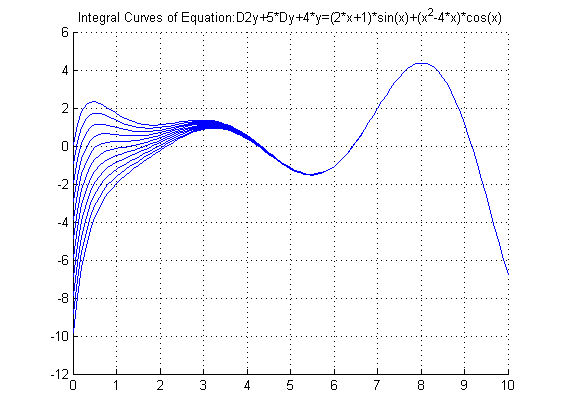
Ответы:

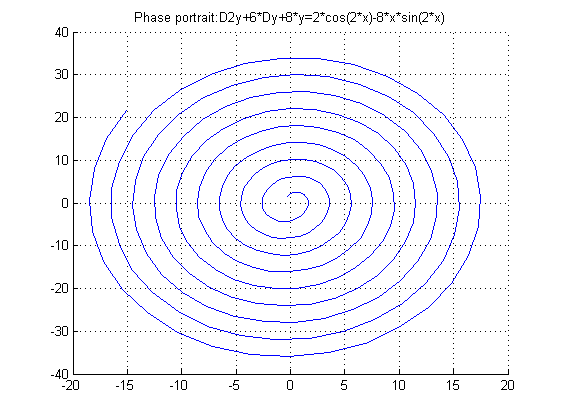
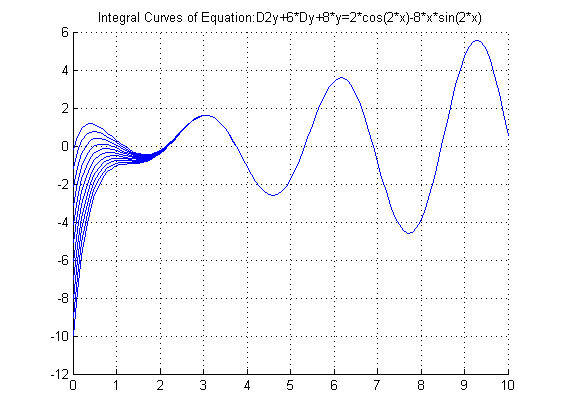
 

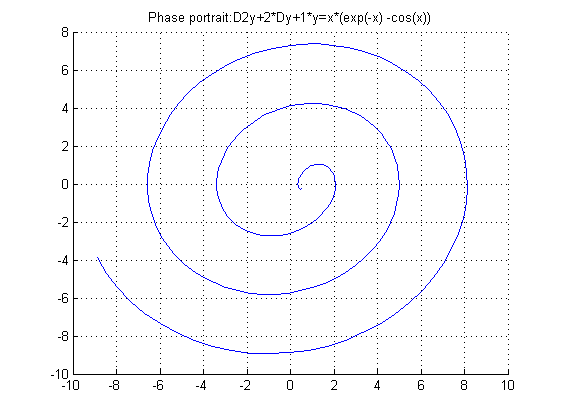
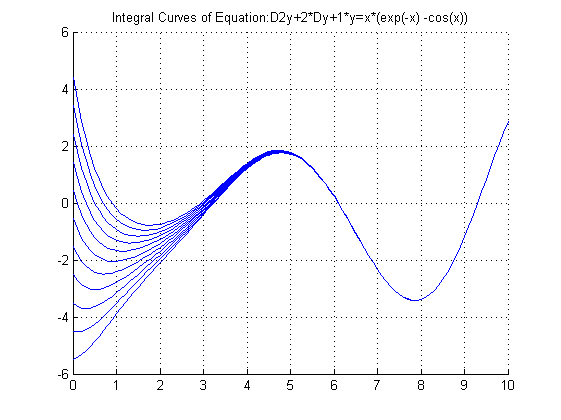
 

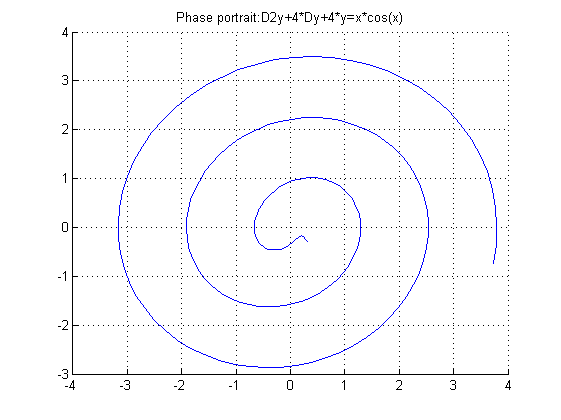
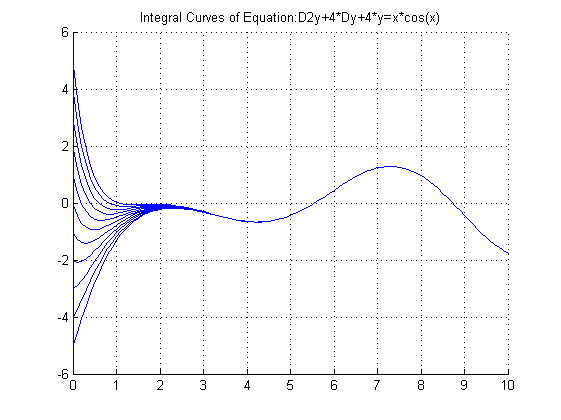
 

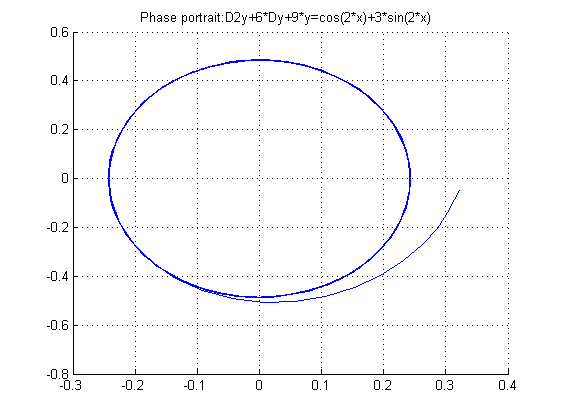
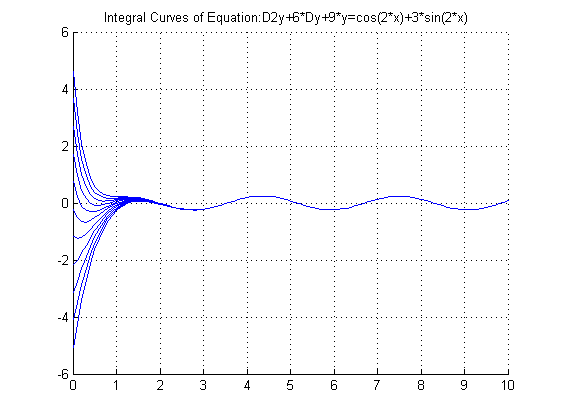
 

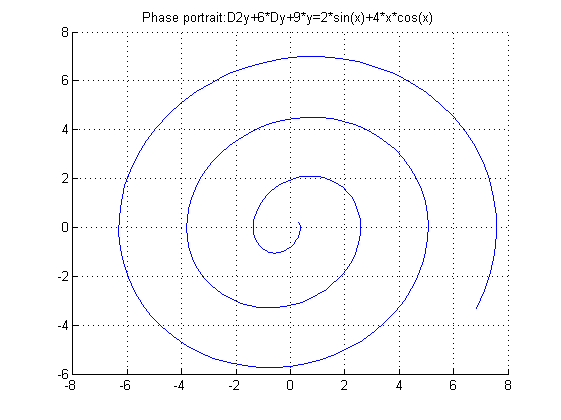
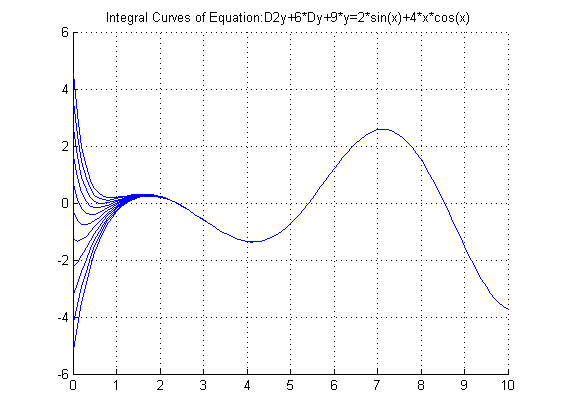
 

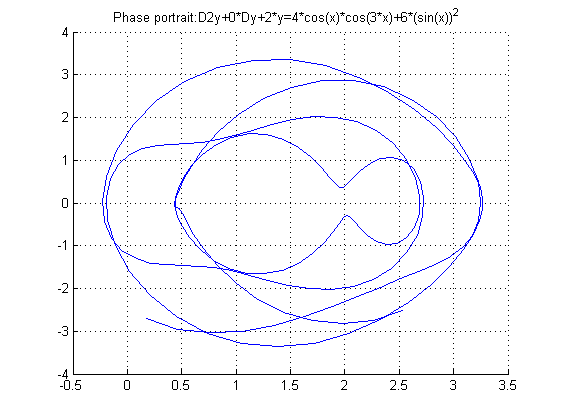
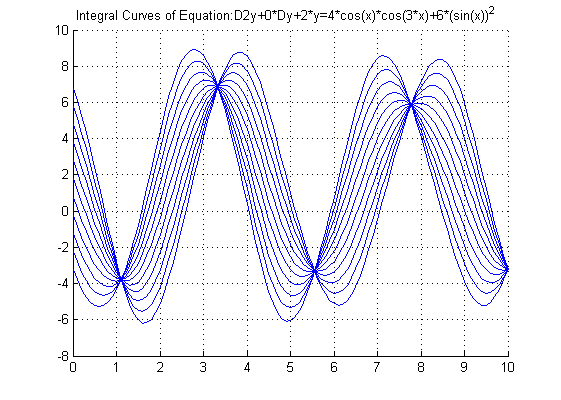
 

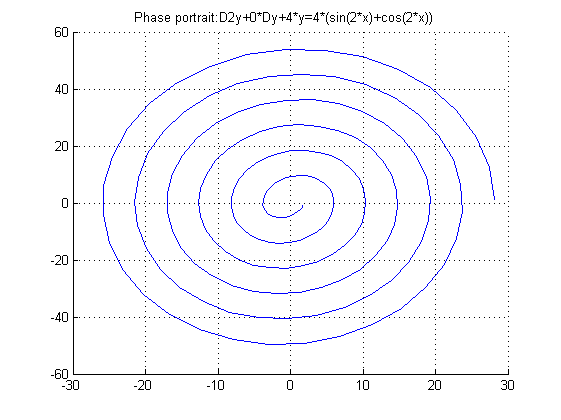
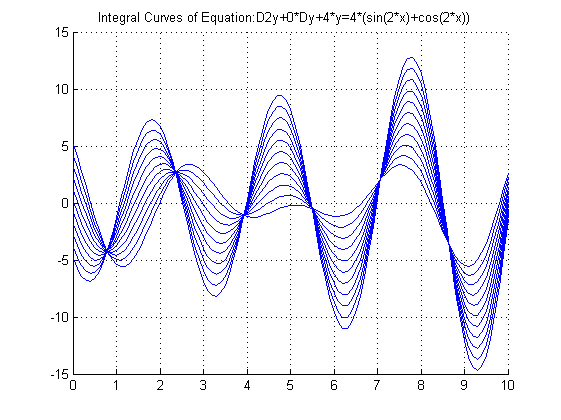
 

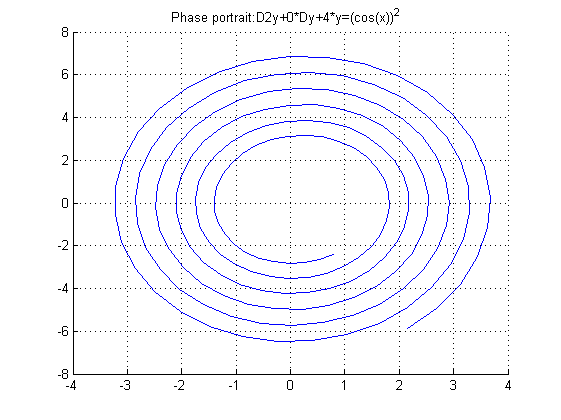
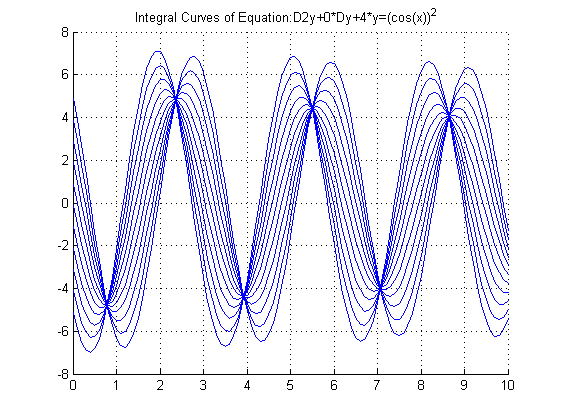
 

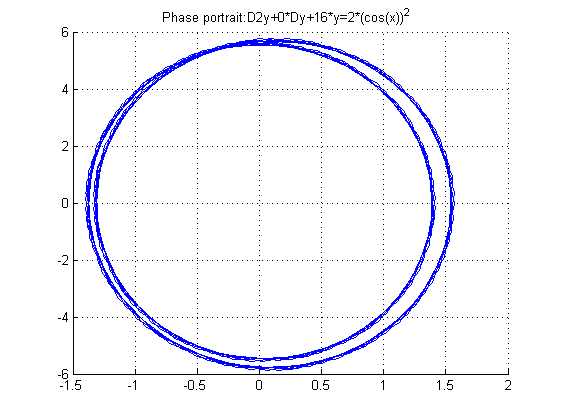
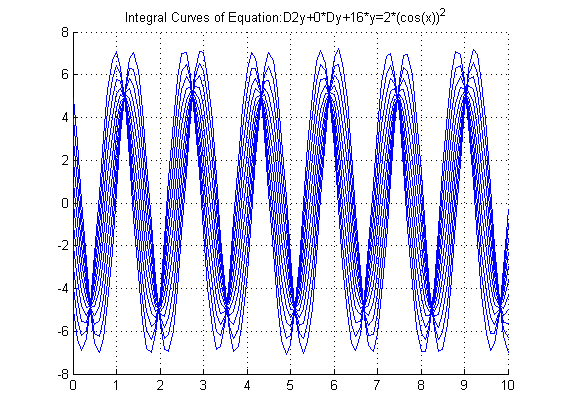
 

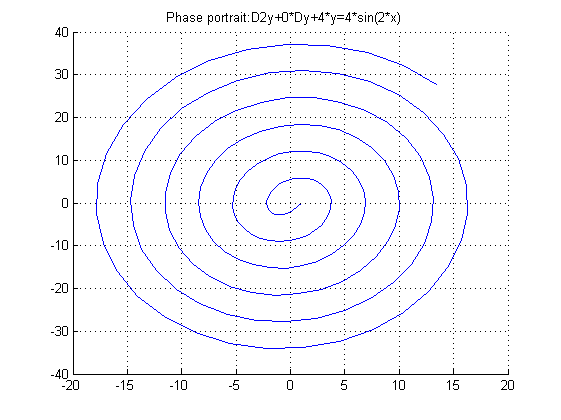
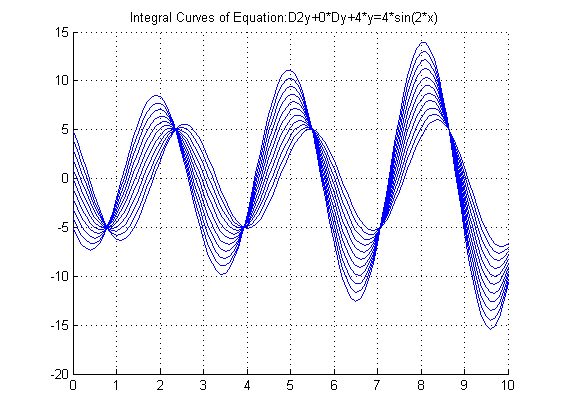
 

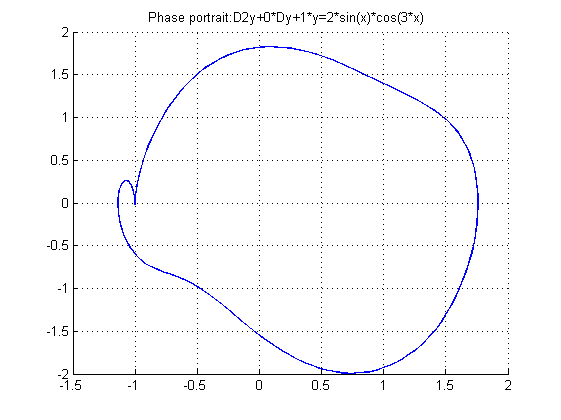
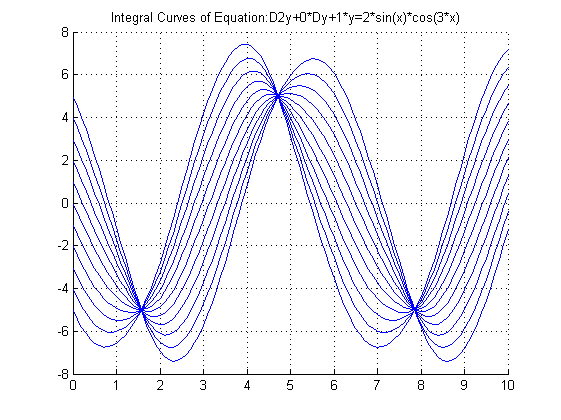
 

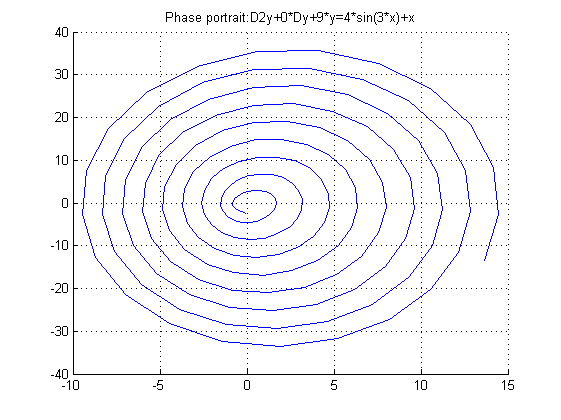
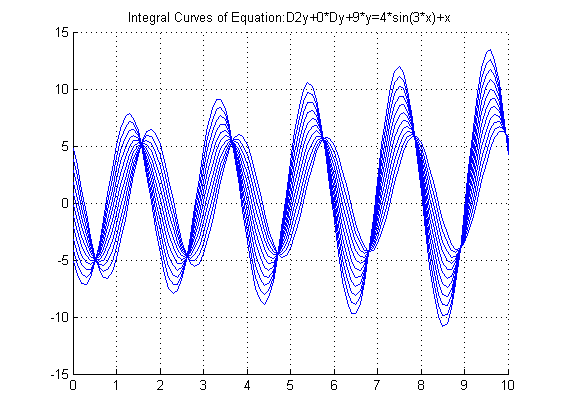
 

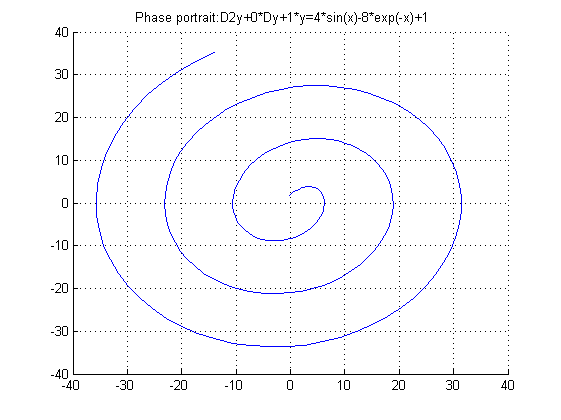
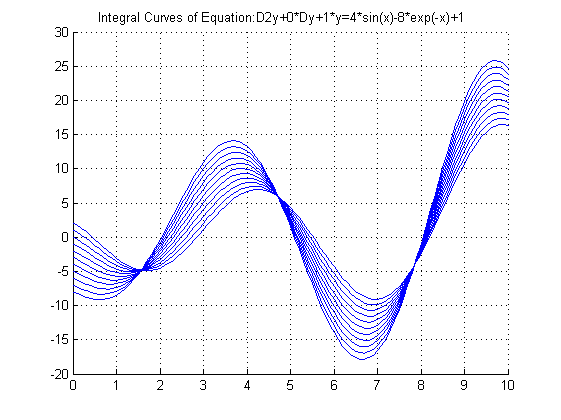
 

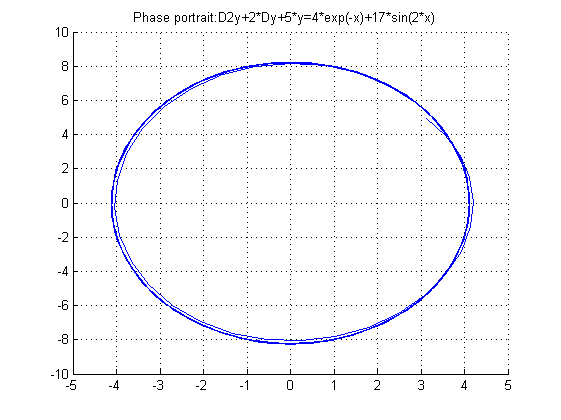
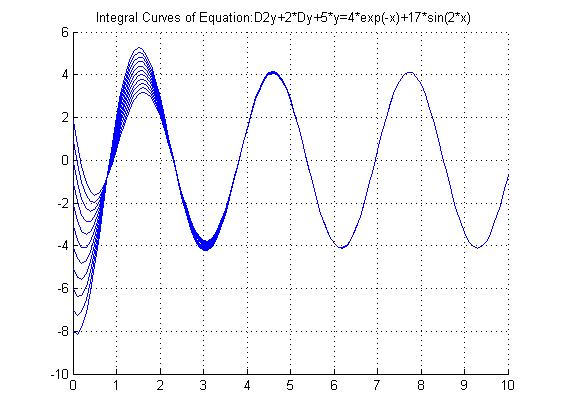
 

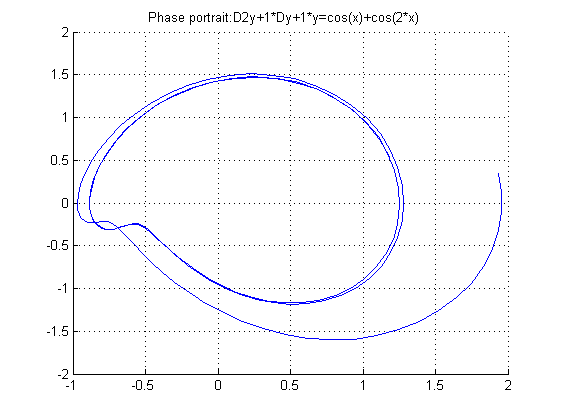
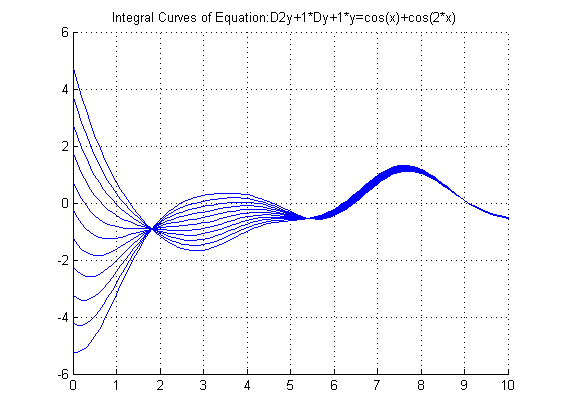
 

Скрипт для нахождения решения уравнения, построения фазового портрета и интегральных кривых:

clf;

syms x y dy InHequation x\_new y\_new dy\_new y\_temp dy\_temp cycle;

InHequation = 'D2y+4\*Dy+4\*y=x\*cos(x)';

y = simplify(dsolve(InHequation, 'x'));

Title=['Phase portrait:',char(InHequation)];

grid on;

hold on;

disp(y);

dy=diff(y,'x');

for cycle = 0 : 0.05 : 10

y\_temp = subs(y, 'C52', 1);

dy\_temp = subs(dy, 'C52', 1);

y\_temp = subs(y\_temp, 'C53', 1);

dy\_temp = subs(dy\_temp, 'C53', 1);

if(abs(double(subs(y\_temp, 'x', cycle)))>10||abs(double(subs(dy\_temp, 'x', cycle)))>10)

break;

end;

end;

x\_new=1:0.1:cycle;

y\_new=subs(y\_temp, 'x', x\_new);

dy\_new=subs(dy\_temp, 'x', x\_new);

plot(y\_new, dy\_new);

title(char(Title));

figure;

grid on;

hold on;

Title=['Integral Curves of Equation:',char(InHequation)];

x\_new=0:0.1:10;

for cycle1=-5:1:5

val=cycle1;

y\_new=subs(y,'C52',val);

for cycle2=-5:1:5

val=cycle2;

y\_new=subs(y\_new,'C53',val);

y\_new=real(double(subs(y\_new,x\_new)));

plot(x\_new,y\_new);

end;

end;

title(char(Title));

Скрипт для нахождения решения уравнения методом Коши:

syms p;

A=[0 1;-6 5];

t0=0;

Y=[1;1];

func=[0;13\*sin(3\*p)];

syms lambda t temp x1 x2;

ASymb=sym(A);

for i=1:1:2

ASymb(i,i)=ASymb(i,i)-lambda;

end;

self\_v=solve(det(ASymb));

E=[1 0;0 1];

Zmatr=[0;0];

Equsystem1=A-self\_v(1)\*E;

X1=Equsystem1\Zmatr;

if(det(Equsystem1)==0)

X1(1)=1; X1(2)=double(-Equsystem1(1,1)/Equsystem1(1,2));

end;

Equsystem2=A-self\_v(2)\*E;

X2=Equsystem2\Zmatr;

if(det(Equsystem2)==0)

X2(1)=1; X2(2)=double(-Equsystem2(1,1)/Equsystem2(1,2));

end;

Ft=sym(zeros(2));

Ft(:,1)=X1\*exp(self\_v(1)\*t);

Ft(:,2)=X2\*exp(self\_v(2)\*t);

Ft=simplify(Ft);

if(det(Ft)==0)

disp('Incorrect values');

else

invft=inv(Ft);

disp('Y(t) =');

right=Ft\*subs(invft,'t',t0)\*Y;

left=Ft\*int(subs(invft,'t','p')\*func,p,t0,t);

disp(right+left);

end;