```
function dxdt=pill(t,x)
dxdt=zeros(2,1);
k1=1.3860;
k2=0.1386;
dxdt(1)=-k1*x(1);
dxdt(2)=k1*x(1)-k2*x(2);
end



%Single Cold Pill
%Analytical Solution
syms x(t) y(t) k1 k2
f=diff(x,t,1)==-k1*x
g=x(0)==2
dsolve(f,g)
h=diff(y,t,1)==k1*x-k2*y
l=y(0)==0
dsolve(h,l)
%Numerical Solution
[t,x]=ode45(@pill,[0 4],[2 0]);plot(t,x);xlabel('Time');ylabel('Pill');title('Single
Cold Pill')


f(t) =diff(x(t), t) == -k1*x(t)


g =x(0) == 2


ans =2*exp(-k1*t)


h(t) =diff(y(t), t) == k1*x(t) - k2*y(t)


l =y(0) == 0


ans =exp(-k2*t)*int(k1*exp(k2*x)*x(x), x, 0, t, 'IgnoreSpecialCases', true,
'IgnoreAnalyticConstraints', true)
```