Hello do you see what is happening here in wxMaxima?
Try to do them yourself and similar things on similar examples?

```
(%i1) v:[x,y];
(%o1) [x,y]

(%i2) f:[r1*T1*y*(1-x)-r1*x,r2*T2*x*(1-y)-r2*y];
(%o2) [r1(1-x)y T1-r1 x, r2 x(1-y)T2-r2 y]

(%i3) h[i,j]:=diff(f[i],v[j])$

(%i4) jacobiana:genmatrix(h,2,2);
```

$$(\%o4)\quad \begin{bmatrix} -r1\,y\,T1-r1 & r1(1-x)\,T1 \\ r2(1-y)\,T2 & -r2\,x\,T2-r2 \end{bmatrix}$$

```
(%i7) equil:solve(f,v);
```

$$(\%o7)\quad \left[\left[x=\frac{T1\,T2-1}{(T1+1)\,T2},\ y=\frac{T1\,T2-1}{T1\,T2+T1}\right],\ [x=0,\ y=0]\right]$$

```
(%i10) j1:ratsimp(subst(equil[1],jacobiana));
```

$$(\%o10)\quad \begin{bmatrix} -\frac{(r1\,T1+r1)\,T2}{T2+1} & \frac{r1\,T1\,T2+r1\,T1}{(T1+1)\,T2} \\ \frac{(r2\,T1+r2)\,T2}{T1\,T2+T1} & -\frac{r2\,T1\,T2+r2\,T1}{T1+1} \end{bmatrix}$$

```
(%i14) detj1:factor(ratsimp(determinant(j1)));
(%o14) r1 r2(T1 T2-1)
```

```
(%i11)  jk:subst([T1=6,T2=3,r1=0.01,r2=0.1],j1);
                 [ - 0.0525   0.011428571428571 ]
(%o11)           [                              ]
                 [  0.0875    - 0.34285714285714 ]

(%i12)  determinant(jk);
(%o12)  0.017

(%i13)  equilk:subst([T1=6,T2=3,r1=0.01,r2=0.1],equil);
                                17          17
(%o13)  [ [ x = --, y = -- ] , [ x = 0 , y = 0 ] ]
                                21          24
```

Try also these:

```
(%i15)  fk:subst([T1=6,T2=3,r1=0.01,r2=0.1],f);
(%o15)  [ 0.06(1 - x)y - 0.01 x , 0.3 x(1 - y) - 0.1 y ]
```

and then plotting:

```
load("plotdf")
plotdf(fk,[xradius,0.5],[yradius,0.5],[xcenter,0.5],[ycenter,0.5])
```

And do you see what is happening here in OCTAVE, try and try also with similar problems you have ...

Write this into file mala.m

```
function xdot = mala (x,t)

r1=0.01;
r2=0.1;
T1=6;
T2=3;

  xdot(1) = r1*T1*x(2)*(1-x(1))- r1*x(1);
  xdot(2) = r2*T2*x(1)*(1-x(2))-r2*x(2);

endfunction
```

and then this into file runmala.m

```
T1=6;T2=3;

x0=[0.5;1];
t = linspace(0,50,200)';
x=lsode("mala",x0,t);
plot(x(:,1),x(:,2))
hold on
x0=[0.8;1];
t = linspace(0,50,200)';
x=lsode("mala",x0,t);
plot(x(:,1),x(:,2))
x0=[1;0.8];
t = linspace(0,50,200)';
x=lsode("mala",x0,t);
plot(x(:,1),x(:,2))
x0=[0.2;1];
t = linspace(0,50,200)';
x=lsode("mala",x0,t);
plot(x(:,1),x(:,2))
x0=[1;0.2];
t = linspace(0,50,200)';
x=lsode("mala",x0,t);
plot(x(:,1),x(:,2))
x0=[0;0.4];
t = linspace(0,50,200)';
x=lsode("mala",x0,t);
plot(x(:,1),x(:,2))
x0=[0.4;0];
t = linspace(0,50,200)';
x=lsode("mala",x0,t);
plot(x(:,1),x(:,2))

u=linspace(0,0.9,100);
v=u./(T1*(1-u));
plot(u,v,'r');
u=linspace(0,0.9,100);
v=u./(T2*(1-u));
plot(v,u,'r');
axis([0,1,0,1]);
```

Put the files into the directory Octave reads and type runmala.
Do you remember this? Explain whats happening.