Problem II (a & b) Solution:

```
%M-file script to plot the hyperbola for the values h=2,a=1, k=2, b=2.
%in the open intervals ]-pi/2,pi/2[ & ]pi/2,3*pi/2[

t1=linspace(-pi/2+pi/20,pi/2-pi/20,100); % this to define the part of the hyperbola in the 4th quadrant and the  one respectivelly
t2=linspace(pi/2+pi/20,3*pi/2-pi/20,100);% this to define the part of the hyperbola in the 2nd quadrant and the third one respectivelly

h=2;
a=1;
k=2;
b=2;

%invoke the user-defined function MyHyperbola.m
%plot it for the specific values of inputs given above
%% this function “MyHyperbola.m” should be defined in order to use it
%% the definition and implementation of the function is shown below

[x1,y1,x2,y2]=MyHyperbola(h,a,k,b,t1,t2);
%plot the hyperbola

plot(x1,y1,'r-',x2,y2,'r-');
title('Hyperbola');
xlabel('x');
ylabel('y');

grid on;

%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
%%%%%%%%%% function MyHyperbola %%%%%%%%%%%%
% to plot both branches of the hyperbola we have to define to intervals
% ]-pi/2,pi/2[ and ]pi/2,3*pi/2[. Both intervals are open intervals to prevent
% having an infinity values.
% outputs are x1, y1, x2, y2
% inputs are h, a, k, b, t1, t2;

function [x1,y1,x2,y2]=MyHyperbola(h,a,k,b,t1,t2)
x1=h+a*sec(t1);
y1=k+b*tan(t1);
x2=h+a*sec(t2);
y2=k+b*tan(t2);
```

Problem II (d) Solution:

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%implementation of the function MyEllipse
%inputs are origin point and minor and major axes
%outputs are the coordinates of points that form the ellipse

function [x,y]=MyEllipse(x0,y0,a,b)
t=0:pi/100:2*pi;
x=a*sin(t)+x0; %parametric representation of x
%with x0 is the x-coordinate of the ellipse origin
y=b*cos(t)+y0; %parametric representation of y
%with y0 is the y-coordinate of the ellipse origin
```