Quiz 4 - Solution

Here is an example of code that will help solve the problem.

```
[1]  function graphPeriod(A)
[2]      N = length(A);
[3]      period = NaN(1,N);
[4]      for n = 1:N
[5]          period(n) = findPeriod(A(n));
[6]      end
[7]      plot(A,period)
[8]      xlabel('amplitude')
[9]      ylabel('period')
[10] end
[11]
[12] function period = findPeriod(A)
[13]     dt = 0.01;
[14]     x = A;
[15]     v = 0;
[16]     t = 0;
[17]     count = 0;
[18]     tc = NaN(1,2);
[19]     par = NaN;
[20]
[21]     while count<2
[22]         [xn,v,tn] = rkStep(x,v,t,dt,par,@acc,4);
[23]         if x>= 0 && xn<0
[24]             count = count+1;
[25]             s = (xn-x)/(tn-t);
[26]             b = x - s*t;
[27]             tc(count) = -b/s;
[28]         end
[29]         x = xn;
[30]         t = tn;
[31]     end
[32]     period = tc(2)-tc(1);
[33] end
[34]
[35] function a = acc(x,~,~,~)
[36]     a = -91*x + 19*x.^3 - x.^5;
[37] end
[38]
```

Calling this code as `graphPeriod(0.1:0.01:10)` we get the following graph.