Problem 5

Main:

```
x1 = [-4:0.1:4];
y1 = fun(x1);
plot(x1, y1)
hold on
plot([-4,4], [0,0])
x2 = [-2,-1,0,1,2];
y2 = fun(x2)
% Then we found the three intervals of three different root of this function which are: [-2,-1], [-1,0], [1,2]
% Now we want to found the root to six correct decimal places
% for root in [-2,-1]:
f=@(x) 2*x^3-6*x-1;
R1=vpa(bisect(f,-2,-1,0.00000005),10)
% for root in [-1,0]
R2=vpa(bisect(f,-1,0,0.00000005),10)
% for root in [1,2]
R3=vpa(bisect(f,1,2,0.00000005),10)
```

fun.m:

```
function y = fun(x)
y = 2.*x.^3-6.*x-1;
end
```

bisect.m

The same as textbook

Result

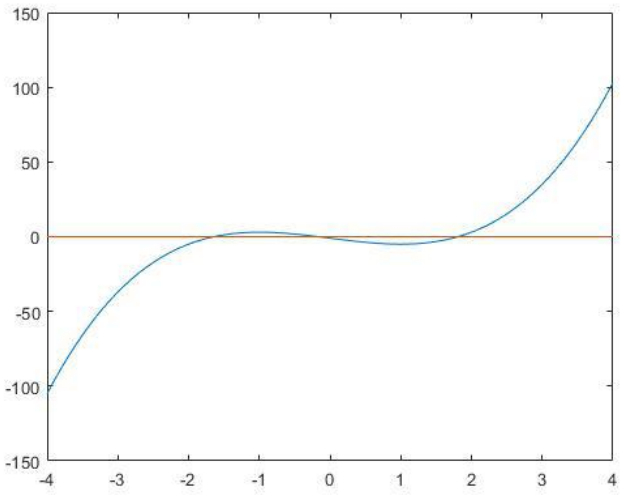
y2 = -5 3 -1 -5 3

R1 = -1.641784

R2 = -0.168254

R3 = 1.810038

Plot:



The three intervals of three different root of this function which are: [-2,-1], [-1,0], [1,2]

And the three roots are: R1 = -1.641784, R2 = -0.168254, R3 = 1.810038

Problem 7

Main:

```
g=@(x) cos(x)*cos(x)
for j=1:300
    If vpa(fpi(g,0,j),7)-vpa(fpi(g,0,j-1),7) == 0
        Break
    End
End
j
r = vpa(fpi(g,0,j),6)
S = abs(-2*cos(r)*sin(r))
```

fpi.m:

The same as textbook

Result:

j=300

r=0.641714

S=0.959 which is no more than 1

So we can conclude that it's local convergence, the steps is 300 and the fixed point is 0.641714