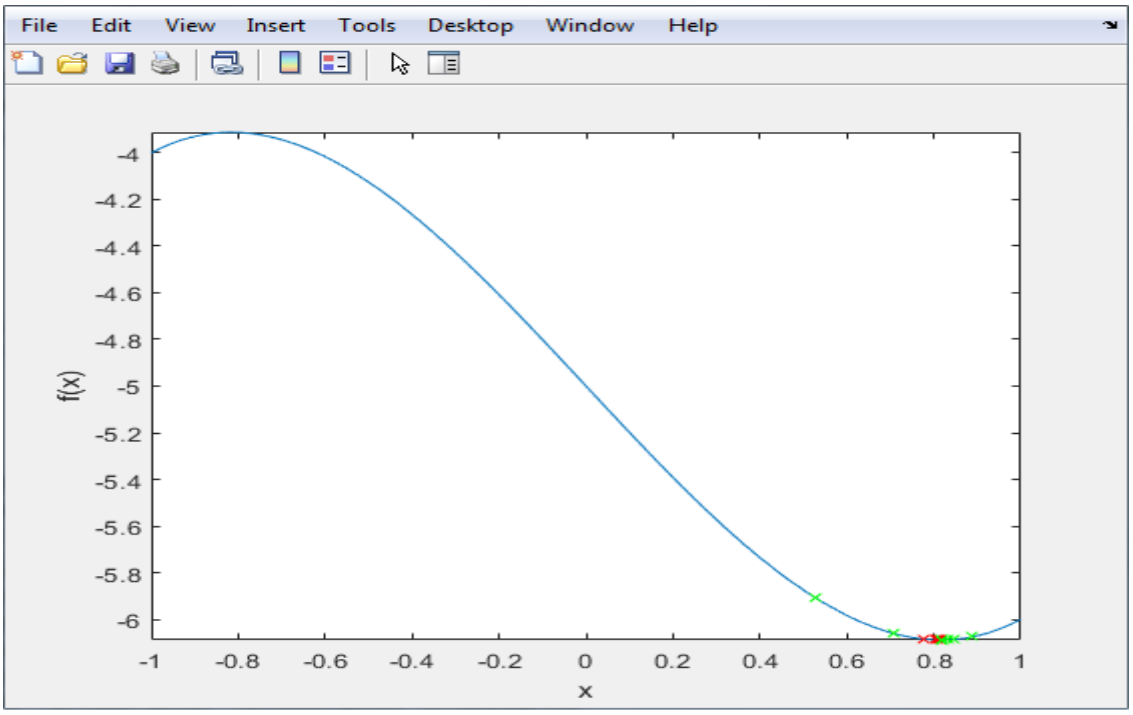
CODE

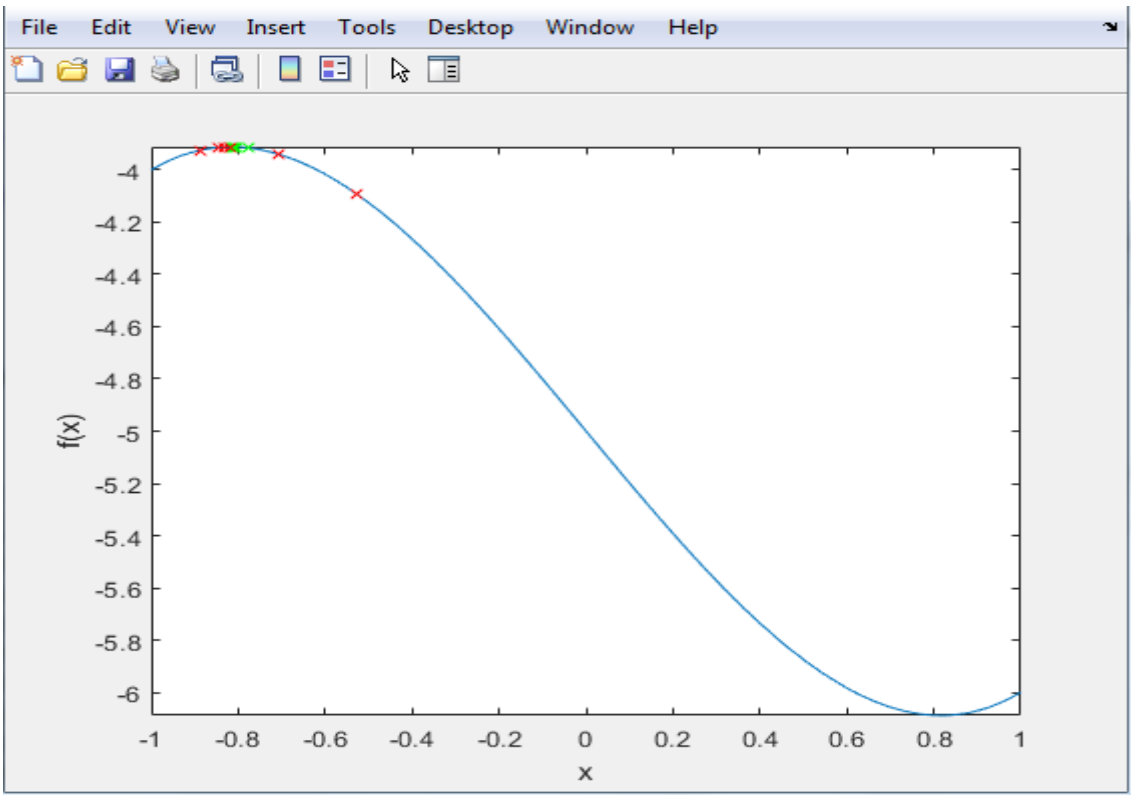
```
f = '      ';            %function

a = -1;
b = 1;
N= 50;                %max iteration
eps = 0.00001     %epsilon

figure,fplot(f,[a,b]), ylabel ('f(x)'), xlabel ('x')
hold on

rho=double((sqrt(5)-1)/2);   % golden proportion coefficient, around 0.618
x1=a+(1-rho)*(b-a);              % computing x values
x2=a+rho*(b-a);
f_x1=f(x1);                          % computing values in x points
f_x2=f(x2);
fprintf('-----------------------------------------------------\n');
fprintf('x1    \t  x2      \t  f(x1)   \t f(x2) \t   b-a\n');
fprintf('%.4e %.4e %.4e %.4e %.4e \n',x1,x2,f_x1,f_x2,b-a);

for i=1:N-2
  if(f_x1<f_x2)        % for finding max point : if(f_x1>f_x2)
    b=x2;
    x2=x1;
    x1=a+(1-rho)*(b-a);

    f_x1=f(x1);
    f_x2=f(x2);

    plot(x1,f_x1,'rx');
    hold on;
  else
    a=x1;
    x1=x2;
    x2=a+rho*(b-a);

    f_x1=f(x1);
    f_x2=f(x2);

    plot(x2,f_x2,'gx');
    hold on;
  end
  fprintf('%.4e %.4e %.4e %.4e %.4e \n',x1,x2,f_x1,f_x2,b-a);
  if (abs(b-a)<=eps)
    fprintf('succeeded after %d steps\n',i);
    return;
  end
end
```

function : $x^3 - 2x - 5$

finding min point between [-1,1]

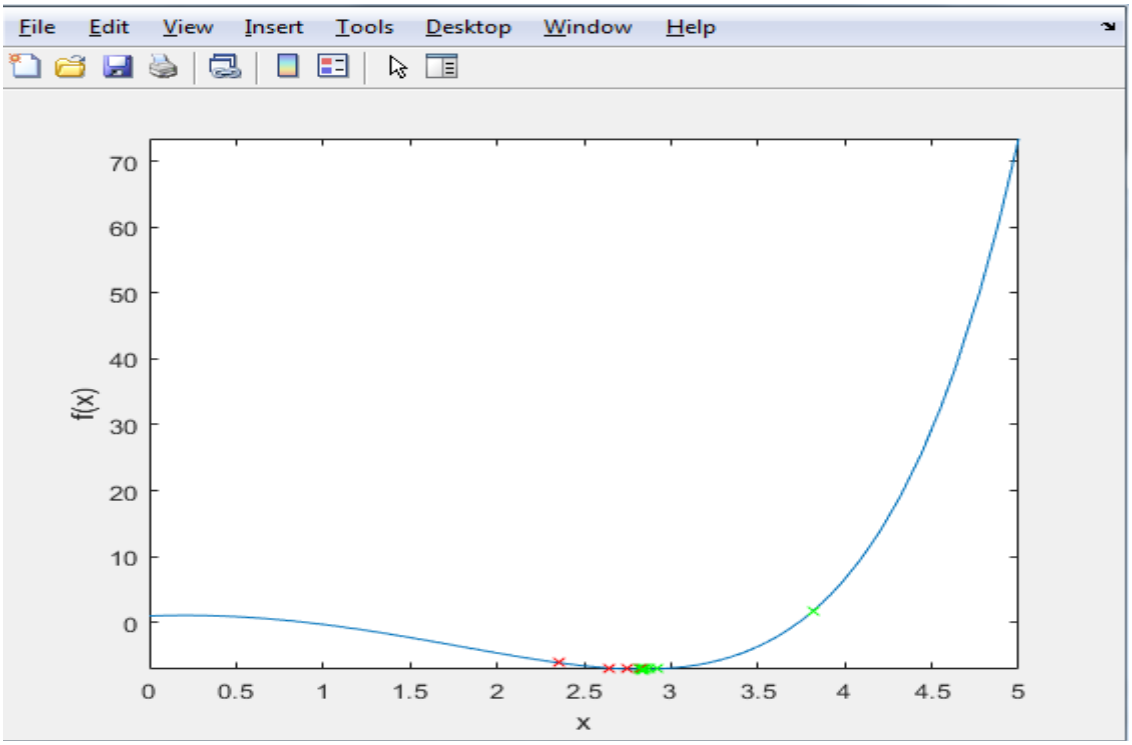


max point between [-1,1]

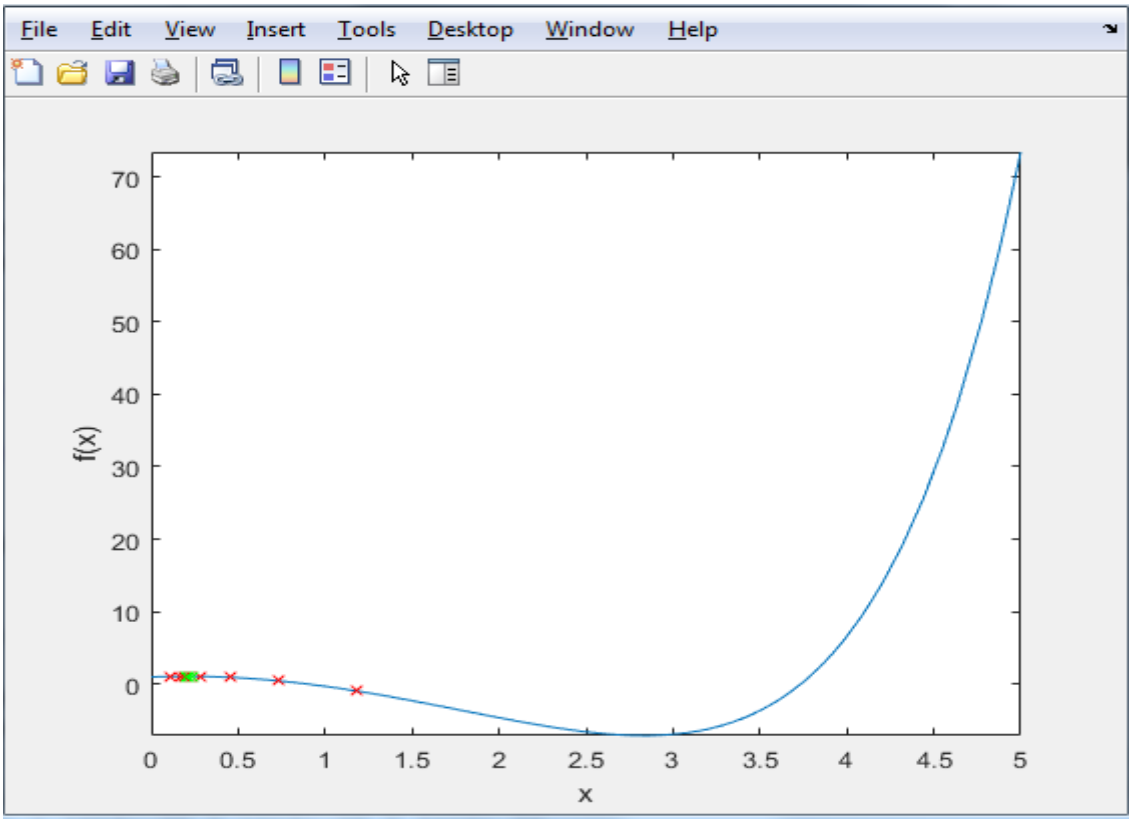


function : $e^x - 3 * x^2$

finding min point between [0,5]

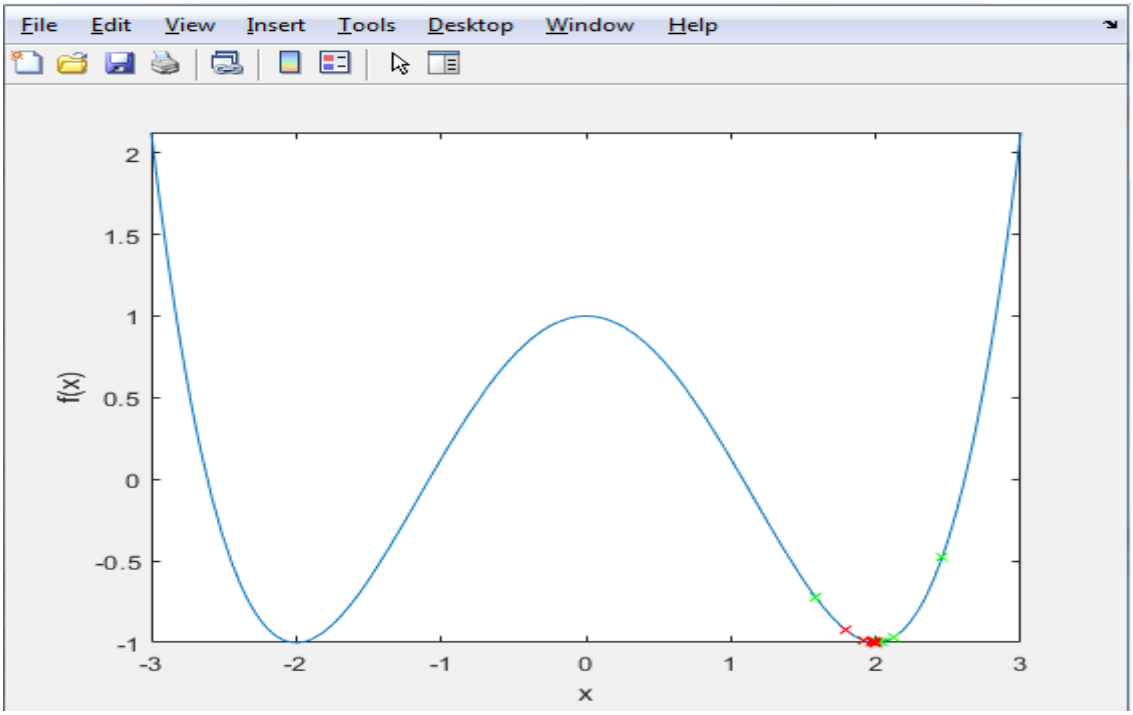


max point between [0,5]

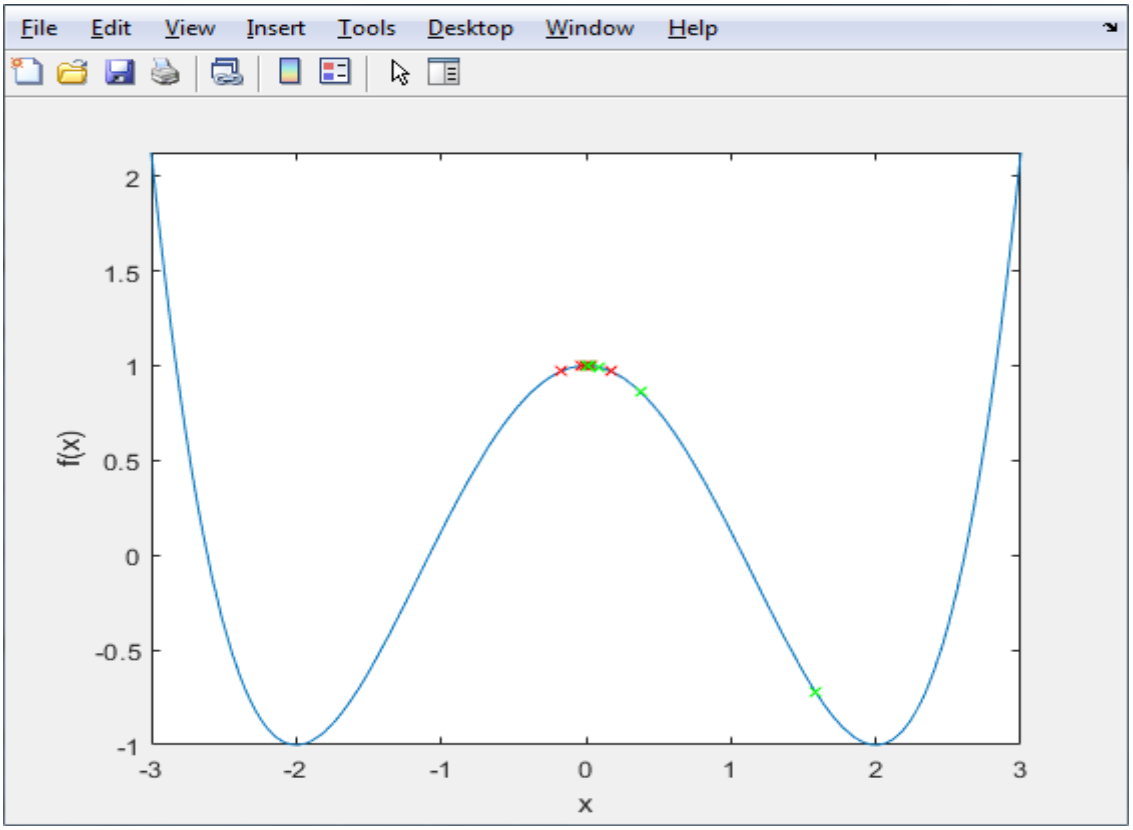


function : $\frac{(x^2-4)^2}{8} - 1$

finding min point between [-3,3]

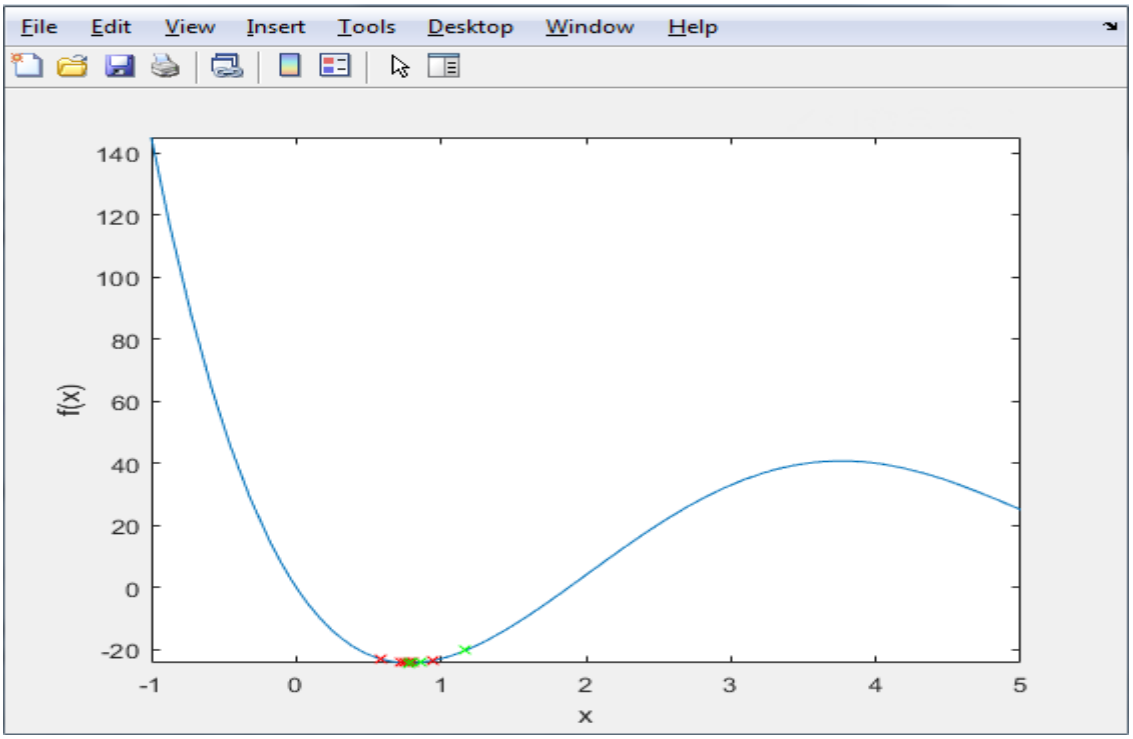


min point between [-3,3]

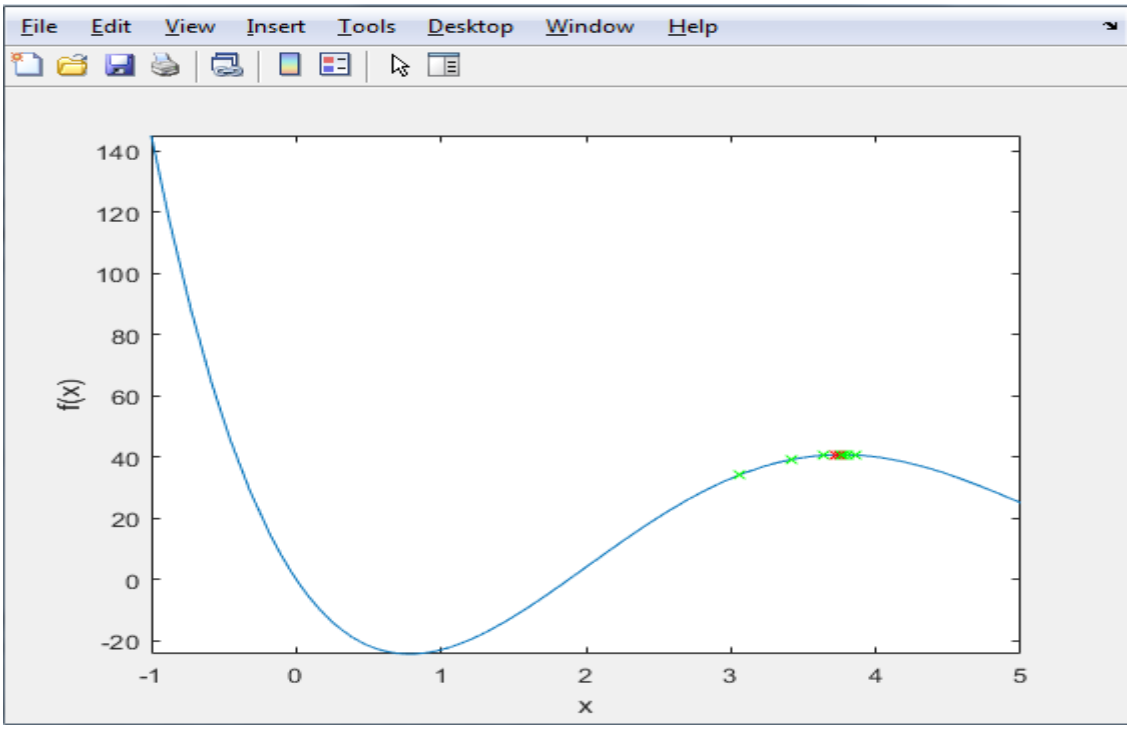


function : $x^4 - 14x^3 + 60x^2 - 70x$

finding min point between [0,4]



max point between [0,4]



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