1.Please use the bisection method to find a zero of the function f(x) = x^7 - 7x^3 + 1 on the interval [1, 3]. If we use the tolerance 10^(-8), how many iteration steps do we need? Please show the result in each iteration step. (It could need a lot iteration steps, so please code the algorithm, and use computer to output the result).

Bisection function M file:

function p = bisection(f,a,b)

if f(a)\*f(b)>0

disp('Wrong choice')

else

p = (a + b)/2;

k=0;

while (b-a > 1e-8)

if f(a)\*f(p)<0

b = p;

else

a = p;

end

p = (a + b)/2;

k=k+1;

end

k

end

end

command window:

>> clear

>> f= inline('x^7 - 7 \* x^3 + 1');

p = bisection(f,1,3)

k =

28

p =

1.6125

>>