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## Problem 1

```
f=@(x) x+4*cos(x);
x1=bisectiona5(f,-2,0,10^(-3),20);
fprintf('First root is x1=%.4f\n',x1)
x2=bisectiona5(f,1,3,10^(-3),20);
fprintf('Second root is x2=%.4f\n',x2)
x3=bisectiona5(f,3,4,10^(-3),20);
fprintf('Third root is x3=%.4f\n',x3)
```

```
First root is x1=-1.2524
Second root is x2=2.1333
Third root is x3=3.5952
```

## Problem 2

```
%The equation to be solved is
%  $h^3-3R^*h^2+4\rho*r^3=0$ , where  $R=5$  and  $\rho=0.120$ 
f=@(h) h.^3-3*5*h.^2+4*0.12*5.^3;
h=falsepa5(f,0,10,10^(-3),20);
fprintf('h=%.4f\n',h)
```

```
h=2.1618
```

## Problem 3

```
k=1.06315;
b=1.5*k/(1+k);
P=secanta5(@(P)P.^(-1.5).*((k+1)*P-1)/k).^b-0.15,1,2,10^-3,100);
fprintf('P=%.4f\n',P)
```

```
P=26.9761
```

## Problem 4

```
Alpha=fixeda5(@(x)((1-x).*(3+x).^0.5)./(3.06*(1+x).^0.5),0.5,10^-3,100);
fprintf('Alpha=%.4f\n',Alpha)
```

---

*Alpha=0.3406*

## Problem 5

```
alpha=newtona5(@(x)x.^3-10,1,10^(-6),100);  
fprintf('The cubic root of 10 is alpha=%4.6f\n',alpha)
```

*The cubic root of 10 is alpha=2.154435*

## Problem 6

```
clear all  
p=newtona5(@(x)exp(-x.^2)-cos(2*x)-1,1,10^(-6),100);  
fprintf('A root is: %.6f\n',p)  
fprintf('If we start with x_0=0, there is a division by 0 in the first  
step.\n')
```

*A root is: 1.234429*

*If we start with x\_0=0, there is a division by 0 in the first step.*

## Problem 7

Observe that  $f(2)=f'(2)=f''(2)=0$ , but  $f'''(2)$  is not zero.

```
a=newtonma5(@(x)(4*x-8)+x.^3-2*x.^2-4*(x.^2-2*x),1,10^-6,100,3);  
fprintf('The triple root is a= %.4f\n',a)
```

*The triple root is a= 2.0000*

## Problem 8

```
X=newtonsysa5(@(x,y)[log(x.^2+y)-1+y;sqrt(x)+x.*y],[2.4;-0.6],0.001,1000)
```

*The method converges after 2 iterations to*

*X =*

```
    2.4122  
   -0.6439
```

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