

General.

```
interface Funcion {  
  
    double valor(double x);  
  
}  
  
class FuncionBinomio implements Funcion{  
  
    double valor(double x){  
  
        return x*x+2*x+1;  
  
    }  
  
}  
  
class FuncionDerivada implements Funcion{  
  
    double valor(double x){  
  
        return 2*x+2;  
  
    }  
  
}
```

Pregunta 1. i) Iterativo

```
static public double raiz(double x1,double x2,double epsilon){  
  
    double xi=x1;  
  
    double xf=x2;  
  
    double x;  
  
    while(epsilon < Math.abs(xf-xi)){  
  
        double yi=valor(xi);  
  
        if(valor(yi)==0)  
  
            return xi;  
  
        double yf=valor(xf);
```

sol12

```
    if(valor(yf)==0)

        return xf;

    double m=(yi-yf)/(xi-xf);

    double n=yf-m*xf;

    x=-n/m;

    if(signo(valor(x))!=signo(yf))//mas adelante se define

        xi=x;

    else

        xf=x;

}

return x;

}
```

```
static public int signo(double numero)

{

    if(numero>0.0)

        return 1

    else if(numero<0.0)

        return -1

    return 0;

}
```

ii)Recursiva

sol12

```
static public double raiz(double x1,double x2,double epsilon){  
    if(epsilon > Math.abs(x2-x1))  
        return x2;  
  
    double y1=valor(x1);  
    double y2=valor(x2);  
    double m=(y1-y2)/(x1-x2);  
    double n=y2-m*x2;  
    double x=-n/m;  
    if(signo(valor(x))!=signo(y2))  
        return raiz(x,x2,epsilon);  
    else  
        return raiz(x1,x,epsilon);  
}
```

Problema 2.

```
static public double raiz(double x, double epsilon, Funcion f, Funcion f1){  
    double x2=x-f.valor(x)/f1.valor(x);  
    if(Math.abs(x2-x)<epsilon)  
        return x2;  
    else  
        return raiz(x2,epsilon,f,f1);  
}
```

Problema 3.

```
static public double sqrtRec(double x, double epsilon, double r1){  
    double r2=(r1+x/r1)/2;
```

sol12

```
        if(Math.abs(r2-r1)<epsilon)

            return r2;

        else

            return sqrt(x,epsilon,r2);

    }

    static public double sqrt(double x, double epsilon){

        return sqrtRec(x,epsilon,2);

    }
```