

1. Develop a Java program that prints all real solutions to the quadratic equation $ax^2+bx+c = 0$. Read in a, b, c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.

```
import java.math.*;

class solution{
    double a,b,c;
    solution(double i,double j,double k){
        a=i;b=j;c=k;
    }
    void sol(){
        double D=(b*b-4*a*c);
        double x1,x2;
        if(D<0){
            x1=-b/2*a;
            x2=(D/2*a);
            System.out.println("IMAGINARY ROOT ARE"+"
"+x1+"+i"+" (" +x2+")"+" AND "+x1+"-i"+" (" +x2+")"+" \n");
        }
        else if(D==0){
            x1=x2=(-b/2*a);
            System.out.println("THE SOLUTION ARE REAL AND EQUAL"+" "+x1+"
"+x2+"\n");
        }
        else{
            x1=(-b+Math.sqrt(D))/2*a;
            x2=(-b-Math.sqrt(D))/2*a;
            System.out.println("THE SOLUTIONS ARE"+" "+x1+" "+x2+"\n");
        }
    }
}

class week1{
    public static void main(String args[]){
        solution s1=new solution(1,2,-3);
        solution s2=new solution(1,2,1);
        solution s3=new solution(1,1,1);
        s1.sol();
        s2.sol();
        s3.sol();
    }
}
```

```
THE SOLUTIONS ARE 1.0 -3.0

THE SOLUTION ARE REAL AND EQUAL -1.0 -1.0

IMAGINARY ROOT ARE -0.5+i(-1.5) AND -0.5-i(-1.5)

Process finished with exit code 0
```