

QUESTION-

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 discriminate b^2-4ac is negative, display a message stating that there are no real solutions.

INPUT-

```
import java.util.*;
import java.lang.Math;
class exp1 {
    public static void main(String args[]){
        Scanner sc = new Scanner(System.in);
        System.out.println("enter the coefficients a,b,c");
        int a=sc.nextInt();
        int b=sc.nextInt();
        int c=sc.nextInt();
        double disc=(b*b)-(4*a*c);
        double r1,r2;
        if(disc>0){
            r1=(-b-(Math.sqrt(disc)))/(2*a);
            r2=(-b+(Math.sqrt(disc)))/(2*a);
            System.out.println("the roots are real and distinct: ");
            System.out.println("root 1 : "+r1);
            System.out.println("root 2 : "+r2);
        }
        else if(disc==0){
            r1=(-b)/(2*a);
            System.out.println("the roots are real and equal: ");
            System.out.println("root 1 : "+r1);
        }
    }
}
```

```

else{

    System.out.println("roots are imaginary");

    double d;

    d=Math.abs(disc);

    r1=(-b)/(2*a);

    r2=(Math.sqrt(d))/(2*a);

    System.out.println("root 1 :"+r1+"i"+r2);

    System.out.println("root 2 :"+r1+"-i"+r2);

}

}

}

```

OUTPUT-

```

C:\Users\BMSCECSE\Desktop\1BM21CS251>java exp1
enter the coefficients a,b,c
1 3 -4
the roots are real and different:
-4.0
1.0

C:\Users\BMSCECSE\Desktop\1BM21CS251>javac exp1.java

C:\Users\BMSCECSE\Desktop\1BM21CS251>java exp1
enter the coefficients a,b,c
1 3 -4
the roots are real and distinct:
root 1 : -4.0
root 2 : 1.0

C:\Users\BMSCECSE\Desktop\1BM21CS251>java exp1
enter the coefficients a,b,c
1 4 4
the roots are real and equal:
root 1 : -2.0

```