

**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.

**Code:-**

```
import java.util.Scanner;

class Equation
{
    public static void main(String args[])
    {
        System.out.println("enter the coefficients a,b,c: ");
        Scanner sc= new Scanner(System.in);
        double a = sc.nextInt();
        if(a==0)
        {
            System.out.println("a cannot be zero!!!");
        }
        else
        {
            double b = sc.nextInt();
            double c = sc.nextInt();
            double z = b*b-4*a*c;
            Equationcheck ob = new Equationcheck();
            if(z<0)
            {
                System.out.println("there are no real solutions");
            }
            else if(z==0)
            {
                System.out.println("the solutions are real and equal!");
                ob.check(a,b,c);
                ob.display();
            }
            else
```

```
{
System.out.println("Solutions are real and distinct!");
ob.check(a,b,c);
ob.display();
}
}
}
}
class Equationcheck
{
double a;
double b;
double c;
double x1;
double x2;
void check(double a, double b, double c)
{
this.a = a;
this.b = b;
this.c = c;
double z = Math.pow(b*b-4*a*c,0.5);
x1=(-b-z)/(2*a);
x2=(-b+z)/(2*a);
}
void display()
{
System.out.println(x1);
System.out.println(x2);
}
}
```

## Output

```
C:\Users\Admin\Desktop\1bm21cs254>Javac Equation.java

C:\Users\Admin\Desktop\1bm21cs254>java Equation
enter the coefficients a,b,c:
1
2
3
there are no real solutions

C:\Users\Admin\Desktop\1bm21cs254>java Equation
enter the coefficients a,b,c:
0
a cannot be zero

C:\Users\Admin\Desktop\1bm21cs254>java Equation
enter the coefficients a,b,c:
-5
9
4
Solutions are real and distinct!
2.1688577540449523
-0.368857754044952

C:\Users\Admin\Desktop\1bm21cs254>java Equation
enter the coefficients a,b,c:
0
a cannot be zero

C:\Users\Admin\Desktop\1bm21cs254>java Equation
enter the coefficients a,b,c:
-6
-4
-3
there are no real solutions

C:\Users\Admin\Desktop\1bm21cs254>
```