S.No: 2	Exp. Name: ***Roots of the quadratic equation***	Date:2024-07-27

Aim:

Write a Java Program to find **Roots** of a Quadratic Equation.

Refer to the displayed sample test cases to strictly match the input and output layout.

Source Code:

q27331/QuadraticEquation.java

```
package q27331;
import java.io.*;
import java.lang.Math;
import java.util.Scanner;
class QuadraticEquation
   {
      public static void main(String args[])
      {
         double a,b,c;
         Scanner obj = new Scanner(System.in);
         System.out.print("Coefficient a: ");
         a = obj.nextDouble();
         System.out.print("Coefficient b: ");
         b = obj.nextDouble();
         System.out.print("Coefficient c: ");
         c = obj.nextDouble();
         double d=b*b-4*a*c , r1,r2;
         double x=Math.sqrt(d);
         if(d==0)
         {
            System.out.print("The roots are real and equal\n");
         r1=(-b+x)/(2*a);
         r2=(-b-x)/(2*a);
         System.out.println("Root: "+r1);
         }
      else if(d<0)
      {
         System.out.print("The roots are imaginary\n");
      }
         else
         {
         System.out.print("The roots are real and distinct\n");
            r1=(-b+x)/(2*a);
            r2=(-b-x)/(2*a);
            System.out.println("Root1: "+r1+" Root2: "+r2);
         }
      }
   }
```

Execution Results - All test cases have succeeded!

Test Case - 1

User Output
Coefficient a: 1
Coefficient b: 6
Coefficient c: 9
The roots are real and equal
Root: -3.0

Test Case - 2
User Output
Coefficient a: 1
Coefficient b: 5
Coefficient c: 8
The roots are imaginary

Test Case - 3
User Output
Coefficient a: 2
Coefficient b: 6
Coefficient c: 1
The roots are real and distinct
Root1: -0.17712434446770464 Root2: -2.8228756555322954

Test Case - 4
User Output
Coefficient a: 2
Coefficient b: 6
Coefficient c: 4
The roots are real and distinct
Root1: -1.0 Root2: -2.0