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

```java
import java.util.Scanner;

class quadratic {
    float d;
    Scanner sc = new Scanner(System.in);

    void check ()
    {
        Sout("Enter the values of a, b, and c");
        int a = sc.nextInt();
        int b = sc.nextInt();
        int c = sc.nextInt();

        if (a==0)
        {
            sout("Invalid equati");
        }
        else {
            d = b*b - 4*a*c;
            sout(d);
            sout("th solutions are");
            if (d>0) {
                Sout("roots are unique");
                double r2 = (-b+ Math.sqrt(d))/2*a;
                double r2 = (-b- Math.sqrt(d))/2*a;
                sout(r1 + " " + r2);
            }
            if (d==0)
            {
                Sout("roots are equal");
                double r = -b/2*a
                Sout(r);
```

```
if ( d < 0)
{
    Sout ("roots are imaginary");
    double r1 = Math.sqrt(-d)/2xa);
    double r2 = (-b)/(2 x a);
    sout ((r2 + "+i" + r1 + "  " + r2 + "-i" + r1));
}
}
}

public class Main {
    psvm (String () args)
    quadratic q1 = new quadratic
    q1.check();
    }
}
```

Output
_____

1) Enter the values of a, b, and c.
23
45
7e

The solutions are
Roots are imaginary.
Root 1 :   -0.978 + i 1.560
Root 2 :   -0.978 - i 1.560

26/9/12

2) Enter the values of a, b, c
1
2
1

Roots are real and equal
Root : -1.0

3) Enter the value of A,B,c
1
-12
35

The solution are:
Roots are real and different
Root 1 : 7.0
Root 2 : 5.0

```java
import java.util.Scanner;

class Quadratic {
    float d;
    Scanner sc = new Scanner(System.in);

    void check() {
        System.out.println("Enter the values of a, b, and c:");
        int a = sc.nextInt();
        int b = sc.nextInt();
        int c = sc.nextInt();

        if (a == 0) {
            System.out.println("Invalid equation");
        } else {
            d = b * b - 4 * a * c;

            System.out.println("The solutions are:");
            if (d > 0) {
                System.out.println("Roots are real and distinct.");
                double r1 = (-b + Math.sqrt(d)) / (2.0 * a);
                double r2 = (-b - Math.sqrt(d)) / (2.0 * a);
                System.out.println("Root 1: " + r1);
                System.out.println("Root 2: " + r2);
            } else if (d == 0) {
                System.out.println("Roots are real and equal.");
                double r = -b / (2.0 * a);
                System.out.println("Root: " + r);
            } else {
                System.out.println("Roots are imaginary.");
                double real = -b / (2.0 * a);
                double imaginary = Math.sqrt(-d) / (2.0 * a);
                System.out.println("Root 1: " + real+ " + i" + imaginary);
                System.out.println("Root 2: " + real + " - i" + imaginary);
            }
        }
    }
}


public class quad {
    public static void main(String[] args) {
        Quadratic q1 = new Quadratic();
        q1.check();
    }
}
```

```
C:\Users\shett\OneDrive\Documents\javaclasslab>javac quad.java

C:\Users\shett\OneDrive\Documents\javaclasslab>java quad
Enter the values of a, b, and c:
23
45
78
The solutions are:
Roots are imaginary.
Root 1: -0.9782608695652174 + i1.5602275535650534
Root 2: -0.9782608695652174 - i1.5602275535650534

C:\Users\shett\OneDrive\Documents\javaclasslab>javac quad.java

C:\Users\shett\OneDrive\Documents\javaclasslab>java quad
Enter the values of a, b, and c:
1
2
1
The solutions are:
Roots are real and equal.
Root: -1.0

C:\Users\shett\OneDrive\Documents\javaclasslab>javac quad.java

C:\Users\shett\OneDrive\Documents\javaclasslab>java quad
Enter the values of a, b, and c:
1
-12
35
The solutions are:
Roots are real and distinct.
Root 1: 7.0
Root 2: 5.0

C:\Users\shett\OneDrive\Documents\javaclasslab>
```