1BM19CS073
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Program: Finding roots of Quadratic equations given coefficients of the powers of x.

```
import java.util.*;
public class Quadratic
 {
        public static void main (String[] args)
   {
                double a,b,c,d,r1,r2;
                Scanner in = new Scanner(System.in);
                System.out.println("This program finds roots of the quadratic equation of the
form ax^2 + bx + c");
                System.out.println("Enter the values of coefficients of x^2,x and constant");
                a = in.nextDouble();
                b = in.nextDouble();
                c = in.nextDouble();
                d = b*b - 4*a*c;
                b = b/(2*a);
                if(d>0)
                {
                        d = Math.sqrt(d)/(2*a);
                        r1 = -b-d;
                        r2 = -b+d;
                        System.out.println("Roots are real and unequal:");
                        System.out.printf("%.4f and %.4f",r1,r2);
                }
                else if(d==0)
                {
                        System.out.printf("The roots are real and equal : %.4f",-b);
                }
                else

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


        }
}
```

OUTPUT:

Case 1: Unequal real roots

```
This program finds roots of the quadratic equation of the form ax^2 + bx + c
Enter the values of coefficients of x^2,x and constant
1
3
2
Roots are real and unequal:
-2.0000 and -1.0000

------------------
(program exited with code: 0)
Press return to continue
```

Case 2: Real equal roots:

```
This program finds roots of the quadratic equation of the form ax^2 + bx + c
Enter the values of coefficients of x^2,x and constant
1
2
1
The roots are real and equal : -1.0000

------------------
(program exited with code: 0)
Press return to continue
```

Case 3: Imaginary roots:

```
This program finds roots of the quadratic equation of the form ax^2 + bx + c
Enter the values of coefficients of x^2,x and constant
1
1
1
The roots are imaginary


------------------
(program exited with code: 0)
Press return to continue
```