

Quadratic Equation

```
import java.util.Scanner;
```

```
class Quadratic
```

```
{
```

```
    int a, b, c;
```

```
    double r1, r2, d;
```

```
    void getd()
```

```
{
```

```
        Scanner s = new Scanner(System.in);
```

```
        System.out.println("Enter the coefficients  
of a, b, c");
```

```
        a = s.nextInt();
```

```
        b = s.nextInt();
```

```
        c = s.nextInt();
```

```
}
```

```
    void compute()
```

```
{
```

```
        while (a == 0)
```

```
{
```

```
            System.out.println("Not a quadratic equation");
```

```
            System.out.println("Enter a non zero value  
for a:");
```

```
            Scanner s = new Scanner(System.in);
```

```
            a = s.nextInt();
```

```
}
```

```
        d = b*b - 4*a*c;
```

```
        if (d == 0)
```

```
{
```

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

```
            System.out.println("Roots are real and  
equal");
```

```
            System.out.println("Root 1 - Root 2 = " + r1);
```

```

    }
    else if (d > 0)
    {

```

$$r1 = ((-b) + (\text{Math.sqrt}(d))) / (\text{double})(2 * a)$$

$$r2 = ((-b) - (\text{Math.sqrt}(d))) / (\text{double})(2 * a)$$

```

    System.out.println("Roots are real and distinct")

```

```

    System.out.println("Root 1 = " + r1 + " Root 2 = " + r2);
    }

```

```

    else if (d < 0)
    {

```

```

        System.out.println("Roots are imaginary")

```

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

$$r2 = \text{Math.sqrt}(-d) / (2 * a);$$

```

        System.out.println("Root 1 = " + r1 + " + i " + r2)

```

```

        System.out.println("Root 1 = " + r1 + " - i " + r2)
    }
}
}

```

```

class QuadraticMain
{

```

```

    public static void main (String args[])
    {

```

```

        Quadratic q = new Quadratic();

```

```

        q.setd();

```

```

        q.compute();
    }
}

```

Output

i) Enter the coefficients of a, b, c:
1 -3 2

Roots are real and distinct

Root 1 = 2 Root 2 = +1

ii) Enter the coefficients of a, b, c:
0 2 3

Not a quadratic equation

Enter a non zero value of a

(iii) Enter the coefficients of a, b, c:
1 2 1

Roots are real and equal

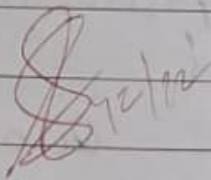
Root 1 = Root 2 = -1

(iv) Enter the coefficients of a, b, c:
1 1 2

Roots are imaginary

Root 1 = $0.0 + i 0.382875$

Root 2 = $0.0 - i 0.382875$

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