

① Develop a Java program that prints all real solⁿ to the quadratic eqⁿ $ax^2+bx+c=0$. Read in a, b, c and use the quadratic formula.

```
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("Root1 = Root2 = " + r1);
```

```
        }
```



```
else if (d > 0)
```

```
{
```

```
    r1 = (-b) + (Math.sqrt(d)) / (double)(2*a);
```

```
    r2 = (-b) - (Math.sqrt(d)) / (double)(2*a);
```

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

```
    System.out.println("Roots=" + r1 + "Root2=" + r2);
```

```
}
```

```
else if (d < 0)
```

```
{
```

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

```
    r2 = Math.sqrt(d) / (2*a);
```

```
    System.out.println("Root1=" + r1 + " + i" + r2);
```

```
    System.out.println("Root2=" + r1 + " - i" + r2);
```

```
}
```

```
}
```

```
}
```

```
class QuadraticMain
```

```
{
```

```
    public static void main (String[] args)
```

```
{
```

```
        Quadratic q = new Quadratic();
```

```
        q.getd();
```

```
        q.compute();
```

```
        System.out.println("Sanketh M Hanasi  
18m12cs242");
```

```
}
```

```
}
```


Output:

Enter the coefficients of a, b, c:

1 2 1

Roots are real and equal

$$\text{Root1} = \text{Root2} = -1.0$$

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Enter

3 4 2

Roots are imaginary

$$\text{Root1} = 0.0 + i 0.10554159678$$

$$\text{Root2} = 0.0 - i 0.10554159678$$

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Enter

1 3 2

Roots are real and distinct

$$\text{Root1} = -1.0 \quad \text{Root2} = -2.0$$

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Ques
12/12/23