

LAB1: Roots of Quad-equation:

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

```
class Lab1
{
```

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

```
        double a, b, c, x1, x2, d, sqst;
```

```
        System.out.println("Enter The Co-efficients  
of Quadratic Equation ( $ax^2+bx+c$ ):");
```

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

```
        a = get.nextDouble();  
        b = get.nextDouble();  
        c = get.nextDouble();
```

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

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

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

```
            sqst = Math.sqrt(d);
```

```
            x1 = (-b + sqst) / (2*a);
```

```
            x2 = (-b - sqst) / (2*a);
```

```
            System.out.printf("The Roots are: Root 1 =  
%0.4f and Root 2 = %0.4f", x1, x2);
```

```
        }
```

```
    else
```

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

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

```
        x1 = (-b) / (2*a);
```

```
        x2 = x1;
```

```
        System.out.printf("The Roots are: Root 1 = %0.4f", x1);
```

and Root 2 = $90.4 \angle 11.82^\circ$;

}

else

$i \in \mathbb{C} \wedge d < 0$

{ System.out.println("In The roots are imaginary : ");
System.out.print("In They are : Root 1 = $90.2 \angle + (90.2 \angle)$ (i);
and Root 2 = $90.2 \angle + (90.2 \angle)$ (i) ",
 $(-b/(2*a)), (-\text{Math.sqrt}(-d)/(2*a)),$
 $(-b/(2*a)), (+\text{Math.sqrt}(-d)/(2*a))$);

}

}

}

(0) get next double;
(1) get next double;
(2) get next double;

$d = (p*d) - (q*q);$

$(d > 0) ?$

System.out.println("In The roots are real and distinct : ");

$-\text{Math.sqrt}(d);$

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

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

System.out.println("In The roots are complex and distinct : ");

$(d = 0) ?$

System.out.println("The roots are equal : ");

$-p/(2*a);$