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IBM19CS090

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### Lab Program -1 :

Develop a Java prog that prints all real solutions to the quadratic equation  $ax^2 + bx + c = 0$ . Read in  $a, b, c$  and use the quadratic formula. If the discriminate  $b^2 - 4ac$  is -ve, display message stating there are no real solutions.

code:

```
import java.util.*;
class roots
{
    public static void main (String args[])
    {
        double a, b, c, x, y, d;
        System.out.println ("Enter the coefficients a, b, c: ");
        Scanner s = new Scanner (System.in);
        a = s.nextFloat();
        b = s.nextFloat();
        c = s.nextFloat();
        d = (b*b) - (4*a*c);
        if (d == 0)
        {
            x = -b / (2*a);
            y = x;
            System.out.println ("Both Roots Are Real and Equal");
            System.out.println ("R1 = " + x + " And R2 = " + y);
        }
        else if (d > 0)
        {
            x = (-b + Math.sqrt(d)) / (2*a);
            y = (-b - Math.sqrt(d)) / (2*a);
        }
    }
}
```

```
System.out.println("Roots Are Real and Distinct");  
System.out.println("R1 = " + x + " And R2 = " + y);
```

```
}
```

```
else
```

```
{
```

```
System.out.println("Roots Are Imaginary. No  
Real Solutions!");
```

```
}
```

```
}
```

```
}
```

(12) Given print 3 more lines about solving

for quadratic equation. It should display the nature of roots (real, imaginary, or complex) and the roots themselves.

$$(x^2 + px + q) = (x^2 + 2x + 3) \quad \text{--- (1)}$$
$$(0 = -2) \quad \text{--- (2)}$$

$$(0 = -2) \quad \text{--- (3)}$$

$$x = -2$$

(Check the roots and don't forget to verify the answer)

(13) Given print 3 more lines about solving



Roots.java

Saved

```
1 import java.util.*;
2 class roots
3 {
4     public static void main(String args[])
5     {
6         double a,b,c,x,y,d;
7         System.out.println("Enter the coefficients a,b,c:");
8         Scanner s=new Scanner(System.in);
9         a=s.nextFloat();
10        b=s.nextFloat();
11        c=s.nextFloat();
12        d=(b*b)-(4*a*c);
13        if(d==0)
14        {
15            x=-b/(2*a);
16            y=x;
17            System.out.println("Both Roots Are Real and Equal ");
18            System.out.println("R1="+x+" And R2="+y);
19        }
20        else if(d>0)
21        {
22            x=(-b+Math.sqrt(d))/(2*a);
23            y=(-b-Math.sqrt(d))/(2*a);
24            System.out.println("Roots Are Real and Distinct");
25            System.out.println("R1="+x+" And R2="+y);
26        }
27        else
28        {
29            System.out.println("Roots Are Imaginary. No Real Solution!");
30        }
31    }
32 }
33
```

× Terminal



Enter the coefficients a,b,c:

1

-16

64

Both Roots Are Real and Equal

R1=8.0 And R2=8.0

Process finished.

× Terminal



Enter the coefficients a,b,c:

2

-3

-1

Roots Are Real and Distinct

R1=1.7807764064044151 And R2=-0.2807764064044

Process finished.

× Terminal



Enter the coefficients a,b,c:

5

-4

2

Roots Are Imaginary. No Real Solution!

Process finished.