

→ Quadratic Equation

```
import java.util.*;  
import java.math.*;  
public class quadratic  
{  
    public static void main (String args[])  
    {  
        Scanner in = new Scanner (System.in);  
        System.out.println ("enter the value of a");  
        System.out.println ("enter the value of b");  
        double a = in.nextDouble();  
        double b = in.nextDouble();  
        System.out.println ("enter the value of c");  
        double c = in.nextDouble();  
        if (a != 0)  
        {  
            double d = b*b - (4*a*c);  
            if (d > 0.0)  
            {  
                double x1 = (-b + Math.pow(d, 0.5)) / (2.0*a);  
                double x2 = (-b - Math.pow(d, 0.5)) / (2.0*a);  
                System.out.println ("the roots are real and distinct");  
                System.out.println ("the roots are " + x1 + " and " + x2);  
            }  
            else if (d == 0.0)  
            {  
                double x1 = -b / (2.0*a);  
                System.out.println ("the roots are real and equal");  
                System.out.println ("the roots is " + x1);  
            }  
        }  
    }  
}
```

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```
}  
else  
{
```

```
System.out.println("the roots are imaginary");  
}  
}
```

```
else  
{  
System.out.println("invalid input");  
}  
}  
}
```

Outputs

- ① enter the value of a
1
enter the value of b
-4
enter the value of c
4
the roots are real and rational

```
enter the coefficients a,b,c
2
3
4
the roots are distinct and imaginary
root1 -0.75+i1.1989578808281798
root2 -0.75-i1.1989578808281798

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java
C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic
enter the coefficients a,b,c
2
9
1
the roots are real and distinct:root1 -6.863999863670617root2 -11.13600093632938
3

C:\Users\STUDENT\Desktop\1BM21CS044>javac quadratic_equation.java
C:\Users\STUDENT\Desktop\1BM21CS044>java quadratic
enter the coefficients a,b,c
0
3
4
it's not a quadratic equation
C:\Users\STUDENT\Desktop\1BM21CS044>
```