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1) Quadratic Equation

#Program

```
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: ");
            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);
        }
```

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```
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("Root1 =" + r1, "Root2 =" + r2);
}
else if (d<0)
{
    System.out.println("Roots are imaginary");
    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();
    }
}
```

OUTPUT:-

```
Enter Coefficients of a, b, c
4, 5, 6
Roots are imaginary
Root1 = 0.0+i 0.5826872164704049
Root2 = 0.0-i 0.5326872164704049
```

Enter the coefficients of a, b, c.
1 -2 1
Roots are real and equal
Root 1 = Root 2 = 1.0

Enter the coefficients of a, b, c.
1 -3 2
Roots are real and distinct
Root 1 = 2.0 Root 2 = 1.0