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1BM19CS006

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8) Write a java program to find all roots of quad eqn

```
import java.util.Scanner;
public class Quad_eqn {
public static void main(String[] args)
{
Scanner sc = new Scanner(System.in);
double r1, r2;
System.out.println("Enter the value of a : ");
double a = sc.nextDouble();
System.out.println("Enter the value of b : ");
double b = sc.nextDouble();
System.out.println("Enter the value of c : ");
double c=sc.nextDouble();

double d = (b*b) -(4*a*c);
double sqrt = Math.sqrt(d);

if (d>=0)
{
r1 = (-b + sqrt)/(2*a);
r2 = (-b - sqrt)/(2*a);
System.out.println("Roots are real and distinct:
%.0.4f and %.0.4f",r1, r2);
}
else if (d==0)
{

r1 =r2;
System.out.println("Roots are real and
```

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```
{equal: " +(-b/(2*a)); %0.4f and %.0.4f, "r1,r2);
}
else if (d<0)
{
System.out.println("Roots are not real and complex");
}
}
}
}
```

Algorithm –

1. Start
2. Read / input a, b, c.
3. Define d as determinant and calculate $d = b^2 - 4ac$.
4. If $d > 0$, 2 real & distinct roots exist.
5. If $d = 0$, 2 real & equal roots exist.
6. If $d < 0$, imaginary roots (complex).
7. Print roots r_1 & r_2 for each case.
8. End