$d = b^2 - 4ac$

$d = 1$

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Program I

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

```
import java.util.Scanner;
class Quadeq
{
    public static void main (String[] args)
    {
        Scanner sc = new Scanner (System.in);
        System.out.println("Enter coefficient of a:");
        double a = sc.nextDouble();
        System.out.println ("Enter coefficient of b:");
        double b = sc.nextDouble ();
        System.out.println("Enter coefficient of c:");
        double c = sc.nextDouble();
        double disc = b*b - 4*a*c;
        if (disc>0)
        {
            double root1 = (-b + Math.sqrt(disc))/(2*a);
            double root2 = (-b - Math.sqrt(disc))/(2*a);
            System.out.println("Equation has two real
                roots: "+root1+" "+root2);
        }
    else if (disc==0)
    {
        double root = -b/2*a;
        System.out.println("Equation has one real solution
                                + root);
    }
```

```
else
{
    System.out.println("Equation has no real roots");
}
}
```

Output I

Real roots and distinct

```
Enter coefficient of a:
2
Enter coefficient of b:
5
Enter coefficient of c:
3
Equation has two real roots: -1.0 -1.5
```

~~Equal~~ ~~root~~

Output II

```
Enter coefficient of a:
1
Enter coefficient of b:
4
Enter coefficient of c:
4
Equation has one real solution: -2.0
```

Output III

```
Enter coefficient of a:
5
Enter coefficient of b:
2
Enter coefficient of c:
4
Equation has no real roots
```

```
import java.util.Scanner;
class Quadeq
{
   public static void main (String[] args)
   {
      Scanner sc = new Scanner (System.in);
      System.out.println("Enter coefficient of a:");
      double a = sc.nextDouble();
      System.out.println("Enter coefficient of b:");
      double b = sc.nextDouble();
      System.out.println("Enter coefficient of c:");
      double c = sc.nextDouble();
      double disc = b*b-4*a*c;
      if(disc>0)
      {
         double root1 = (-b+Math.sqrt(disc))/(2*a);
         double root2 = (-b-Math.sqrt(disc))/(2*a);
         System.out.println("Equation has two real roots: "+root1+" "+root2);
      }
      else if(disc==0)
      {
         double root = -b/(2*a);
         System.out.println("Equation has one real solution: "+root);
      }
      else
      {
         System.out.println("Equation has no real roots");
      }
   }
}
```

```
D:\1BM23CS330>java Quadeq
Enter coefficient of a:
2
Enter coefficient of b:
5
Enter coefficient of c:
3
Equation has two real roots: -1.0 -1.5

D:\1BM23CS330>java Quadeq
Enter coefficient of a:
1
Enter coefficient of b:
4
Enter coefficient of c:
4
Equation has one real solution: -2.0

D:\1BM23CS330>java Quadeq
Enter coefficient of a:
5
Enter coefficient of b:
2
Enter coefficient of c:
4
Equation has no real roots

D:\1BM23CS330>
```