Program 1:

Develop a Java program 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 negative, display a message stating that there are no real solutions.

```
import java.util.*;
class quadratic
{
public static void main (String args[]) {

   Scanner in = new Scanner (System.in);
double a, b, c;
double D;
double R1, R2;
System.out.println("Enter the value of a");
 a = in.nextInt();
System.out.println ("Enter the value of b");
 b = in.nextInt();
System.out.println ("enter the value of c");
 c = in.nextInt();
```

```
D = b*b - (4*a*c);
if (D>0) {
System.out.println("Roots are Real and
                    Unequal");
R1 = (-b + Math.pow(D,0.5))/(2*a);
R2 = (-b - Math.pow(D,0.5))/(2*a);
System.out.println("Roots are=" +R1+"," +R2);
}
else if(D==0)
{
System.out.println("Roots are Real and
                    Equal);
R1 = -b/(2*a);
R2 = R1
System.out.println("Root is =" +R1);
}
else
{
System.out.println("The Equation has no
                    real roots");
}
}
}
```

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Algorithm

(i) Input a, b, c

(ii) $d = b^2 - 4ac$

(iii) if (d = 0)

printf ("Two equal roots")

$r_1 = -b/2a$

$r_2 = r_1$

(iv) else if (d > 0)

printf ("Two distinct real roots")

$r_1 = (-b + sqrt(d))/2a$

$r_2 = (-b - sqrt(d))/2a$

(v) else

print ("No real solution")

(vi) Exit.

Output:

Enter the value of a

1

Enter the value of b

6

Enter the value of c

9

Roots are real and Equal

Root is = -3.0