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Develop a Java program that prints all real solutions to the quadratic equations $ax^2 + bx + c = 0$. 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.

ALGORITHM:

Step 1 Start

Step 2 Input the value of a, b, c

Step 3 Calculate D = (b*b - (4*a*c))

Step 4 If (d > 0)

{ Display roots are real, calculate the roots $\Rightarrow r1 = (-b + \sqrt{D})/(2*a)$ and $r2 = (-b - \sqrt{D})/(2*a)$

else if (d = 0)

Display roots are equal, calculate the roots $\Rightarrow r_1 = r_2 = -b/(2*a)$

else Display 'there are no real roots'.

Step 5 Print r1 and r2

Step 6 Stop

PROGRAM:

```
import java.util.Scanner;
import java.lang.Math;
public class Main
{
public static void main (String[] args) {
Scanner in = new Scanner(System.in);
```

```
int a,b,c;
double r1, r2, d;
char ch;
System.out.println("Solution of Quadratic equation -ax^2+bx+c");
do
{
System.out.println("\nenter a: ");
a=in.nextInt();
System.out.println("enter b: ");
b=in.nextInt();
System.out.println("enter c: ");
c=in.nextInt();
d=((b*b)-(4*a*c));
 if(d>0)
{
r=((-b+Math.sqrt(d))/(2*a));
r2=((-b-Math.sqrt(d))/(2*a));
System.out.println("roots are -\n"+"r= "+r+"\n"+"r2= "
                   +r2);
}
else if(d==0)
{
 r=(-b/(2*a));
System.out.println("roots are equal-\n"+"r1=r2= "+r1);
```

```
}
else
{
System.out.println("there are no real roots");
}
System.out.println("\n"+"do you want to find another set of roots?
y\n?);
ch=in.next().charAt(0);
}
while(ch=='y');
}
}
```