Lab program - ①.

1) Develop a Java program that prints all real world 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.

Algorithm: 1) Input a, b, c.

2) d = b^2-4ac.

3) if (d = 0)

print("Two equal roots");

~~r1~~ r1 = -b/2a.

r2 = r1.

4) else if (d > 0)

print("Two distinct real roots")

r1 = (-b + ~~math~~.sqrt(d))/2a

r2 = (-b - sqrt(d))/2a.

5) else

print("No real solution")

6) Exit.

```
class quadratic{
public static void main(String[] args){
double a, b, c, r1=0, r2=0;
System.out.print("Enter coefficients a, b and
c of quadratic equation");
Scanner in = new Scanner(System.in);
```

```
a = in.nextFloat();
b= in.nextFloat();
c = in.nextFloat();
double d = (b*b)-(4*a*c);
if (d==0)
{
   System.out.println("Two equal real roots");
   r1 = -b/2*a;
   r2 = r1;
}
else if (d>0)
{
   System.out.println("Two distinct real roots");
   r1 = -b + Math.sqrt(d)/2*a;
   r2 = -b- Math.sqrt(d)/2*a;
}
else
{
   System.out.print("No real roots");
   System.exit(0);
}
System.out.println("Roots of quadratic equation are r1 = "+r1+" and r2 = "+r2);
}
}
```

Expected output:

Enter coefficients of a, b and c of quadratic equation 1 2 1

Two equal real roots

Roots of quadratic equation are r1 = -1.0 and r2 = -1.0

Enter coefficients a, b and c of quadratic equation 1 4 2

Two distinct real roots

Roots of quadratic equation are r1 = -2.585 and r2 = -5.414

Enter coefficients a, b and c of quadratic equation 2 1 1

No real roots.