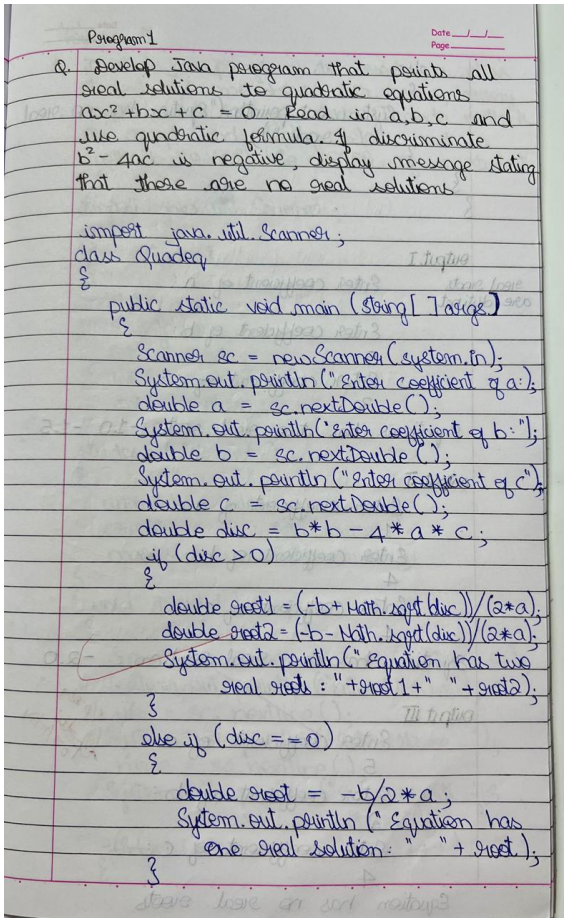
QUADRATIC EQUATION:

```
import java.util.Scanner;

class Quad_Eq_cal{
   public static void main(String [] args){
      int y=0;
      Scanner sc=new Scanner(System.in);
      System.out.println("General form  of a quadratic equation is ax^2+bx+c=0");
      do{
         System.out.print("\nEnter value of a=");
         int a=sc.nextInt();
         System.out.print("Enter value of b=");
         int b=sc.nextInt();
         System.out.print("Enter value of c=");
         int c=sc.nextInt();
         float d=(float)(Math.pow(b,2)-4*a*c);
         if(d<0){
            System.out.println("There are no real solutions");
         }
         else if(d==0){
            System.out.println("It has one repeated root(2 equal roots):");
            float r=-b/(2.0f*a);
            System.out.println("x="+r);
         }
         else{
            System.out.println("It has two distinct roots:");
            double r1=((-b+Math.sqrt(d))/(2*a));
            System.out.println("x1="+r1);
            double r2=((-b-Math.sqrt(d))/(2*a));
            System.out.println("x2="+r2);
```

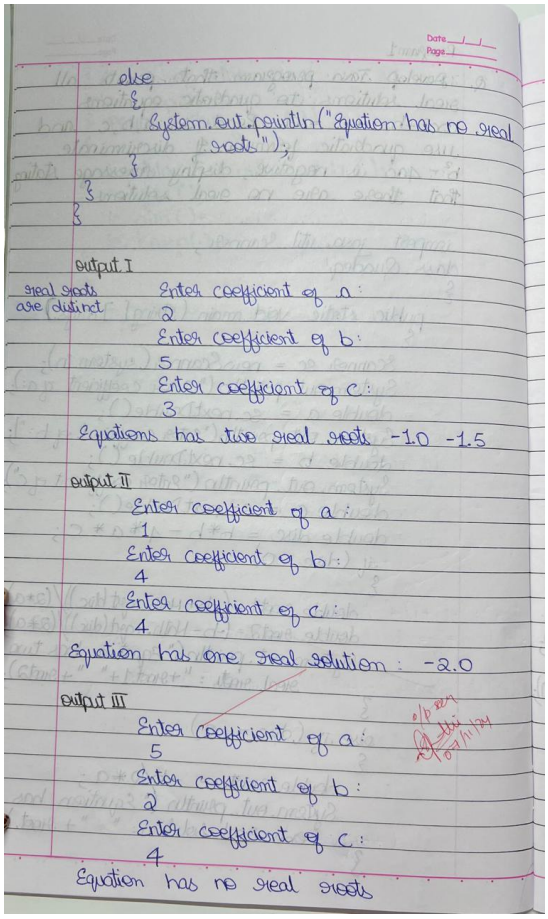
```
        }
        System.out.println("\nDo you want to calculate again?(yes=0 and no=1): ");
        y=sc.nextInt();
      }while(y==0);
   }
}
```



Program 1

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

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

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
```