

8/1/24

## Quadratic Equation

```
import java.util.Scanner;
```

```
class Quad
```

```
{  
    int a, b, c;  
    double x1, x2, d;  
    void input ()
```

```
{  
    Scanner sc = new Scanner(System.in)
```

```
    a = sc.nextInt();
```

```
    b = sc.nextInt();
```

```
    c = sc.nextInt();
```

```
}
```

```
void compute ()
```

```
{  
    while (a == 0 || b == 0 || c == 0)
```

```
{  
    System.out.println("Invalid input");
```

```
    d = (b * b) - (4 * a * c);
```

```
    if (d == 0)
```

```
{  
        x1 = (-b) / (2 * a);
```

```
        System.out.println("roots are real and equal");
```

```
        System.out.println("root 1 = root 2 = " + x1);
```

```
}
```

```
else if (d < 0)
```

```
{  
    System.out.println("roots are imaginary");
```

```
    x1 = (-b) / (2 * a);
```

```
    x2 = (Math.sqrt(-d)) / double(2 * a);
```

```
    System.out.println("roots = " + x1 + "i" + x2);
```

```
    System.out.println("roots = " + x1 + "-i" + x2);
```

```
}
```

```
else if (d > 0)
```

```
{  
    x1 = ((-b) + (Math.sqrt(d))) / double(2 * a);
```

```
    x2 = ((-b) - (Math.sqrt(d))) / double(2 * a);
```

```
    System.out.println("roots are equal & distinct");
```

```
    System.out.println("root 1 = " + x1 + "root 2 = " + x2);
```

```
}
```



## Class QuadRun

```
{  
    public static void main (String a[])  
    {  
        Quad q = new Quad ();  
        q.input ();  
        q.compute ();  
    }  
}
```

### Output;

Enter value of a: 1

Enter value of b: 1

Enter value of c: 1

Roots are not real

Enter value of a: 1

Enter value of b: 9

Enter value of c: 1

Roots are: -0.1125 and -8.887

Roots are real and distinct.

*Dr.*  
08/01/24

## QUADRATIC ROOTS

```
import java.util.Scanner;
class Quad{
int a,b,c;
double d,r1,r2;
void input(){
Scanner sc=new Scanner(System.in);
System.out.println("Enter coefficients");
a=sc.nextInt();
b=sc.nextInt();
c=sc.nextInt();
}
void calc(){
double d=(b*b)-(4*a*c);
if(a==0||b==0||c==0){
System.out.println("invalid inputs");
}
else if(d>0){
System.out.println("roots are real and distinct");
r1=(-b+(Math.sqrt(d))/(2*a));
r2=(-b-(Math.sqrt(d))/(2*a));
System.out.println("r1="+r1);
System.out.println("r2="+r2);
}
else if(d==0){
System.out.println("Roots are real and equal");
r1=r2=-b/(2*a);
System.out.println("r1="+r1);
System.out.println("r2="+r2);
}
else{
System.out.println("Roots are imaginary");
r1=-b/(2*a);
r2=Math.sqrt(-d)/(2*a);
System.out.println("r1="+r1+"+i"+r2);
System.out.println("r2="+r1+"-i"+r2);
}
}
}

class QuadMain{
public static void main(String args[]){
Quad q=new Quad();
q.input();
}
```

## QUADRATIC ROOTS

```
q.calc();  
}  
}
```

Output:

Enter coefficients

10 0 5

invalid inputs.

Enter coefficients

1 5 2

roots are real and distinct

r1=-2.9384471871911697

r2=-7.061552812808831

Enter coefficients

10 2 20

Roots are imaginary

r1=0.0+i1.4106735979665885

r2=0.0-i1.4106735979665885

Enter coefficients

1 2 1

Roots are real and equal

r1=-1.0

r2=-1.0