

Program Number: 3

Title: Root of Quadratic Equation

Aim: To write a program to find the roots of a quadratic equation

Algorithm:

1. Start
2. Read coefficient of quadratic equation a, b, c
3. assign discriminant as $b^2 - 4ac$
4. if k greater than zero
 - 4.1 . Assign root1 as $(-b + \sqrt{\text{discriminant}})/2a$
 - 4.2. Assign root2 as $(-b - \sqrt{\text{discriminant}})/2a$
 - 4.3. print two real solutions solution 1 and solution2
5. if k equal to zero, assign solution as $-b/2a$ and print solution
6. else
 - 6.1. Assign root1 as $(-b + \sqrt{k})/2a$
 - 6.2 Assign root2 as $(-b - \sqrt{k})/2a$
 - 6.3 print two imaginary solutions solution 1 and solution2
7. End

Program:

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```

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Done by : Deepak M S

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```
#include <math.h>
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```
#include <stdio.h>
```

```
int main() {
```

```
    float a, b, c, discriminant, root1, root2, realPart, imagPart;
```

```
    printf("Enter coefficients a, b and c: ");
```

```
    scanf("%f %f %f", &a, &b, &c);
```

```

discriminant = b * b - 4 * a * c;

// condition for real and different roots
if (discriminant > 0) {
    root1 = (-b + sqrt(discriminant)) / (2 * a);
    root2 = (-b - sqrt(discriminant)) / (2 * a);
    printf("root1 = %f and root2 = %f", root1, root2);
}

// condition for real and equal roots
else if (discriminant == 0) {
    root1 = root2 = -b / (2 * a);
    printf("root1 = root2 = %f;", root1);
}

// if roots are not real
else {
    realPart = -b / (2 * a);
    imagPart = sqrt(-discriminant) / (2 * a);
    printf("root1 = %f+%fi and root2 = %f-%fi", realPart, imagPart, realPart,
imagPart);
}

return 0;
}

```

Output:

```

Enter coefficients a, b and c: 1
6
8
root1 = -2.000000 and root2 = -4.000000

...Program finished with exit code 0
Press ENTER to exit console.

```

Result: Program Successful . Able to find Square Root of Quadratic Equation