

Algorithm

Step 1: Start

Step 2: Input values of a, b, and c

Step 3: Calculate the discriminant

$$d = b^2 - 4ac$$

Step 4: If $d > 0$, then

Calculate two real and different roots

Display root1 and root2

Step 5: Else if $d = 0$, then

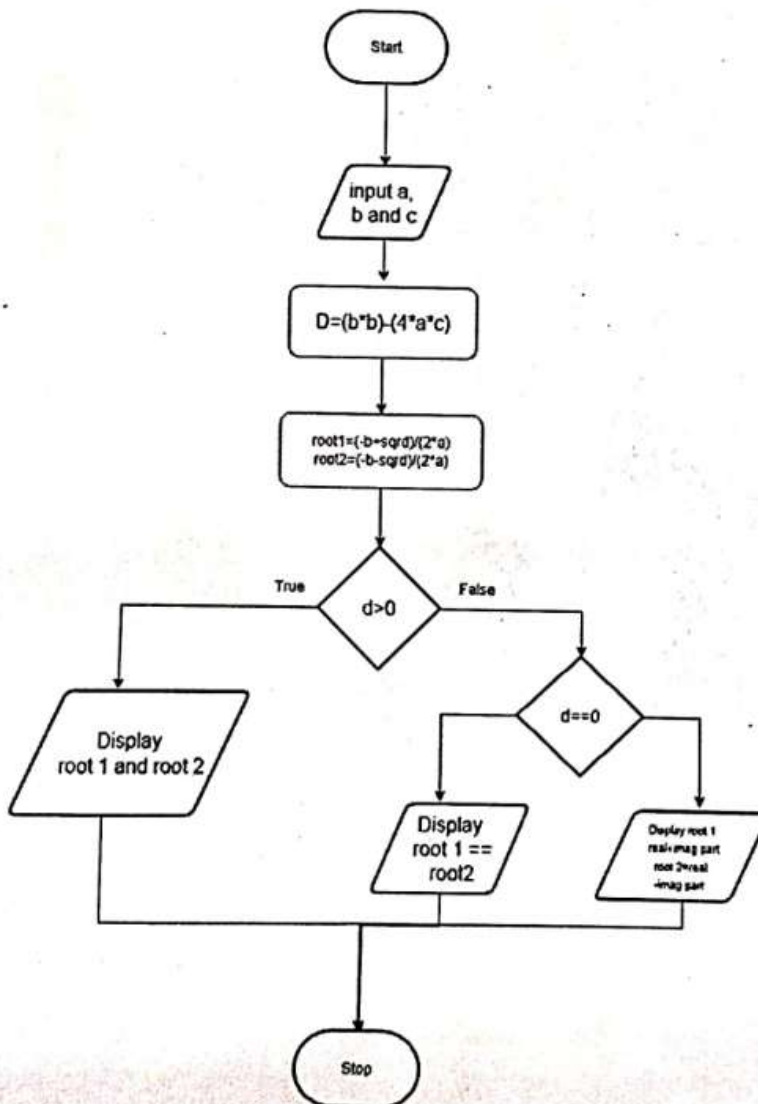
Calculate one real and equal root

Display root1 = root2

Step 6: Else ($d < 0$), then

Calculate two complex roots Display complex root1 and root2

Step 7: Stop



CODETANTRA

manaswi.butle.batch2025@vitnagpur.siu.edu.in

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2.1.1. Roots of a Quadratic Equation

Write a program to find the roots of a quadratic equation, given its coefficients a , b , and c . Use the quadratic formula: $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

The discriminant $D = b^2 - 4ac$ determines the nature of the roots:

- If $D > 0$: Roots are real and different
- If $D = 0$: Roots are real and the same
- If $D < 0$: Roots are imaginary

Input Format:

- Three space-separated integers representing the coefficients a , b , and c , respectively.

Output Format:

- If roots are real and different, print:

```
root1 = <root1>
root2 = <root2>
```

- If roots are the same, print:

```
root1 = root2 = <root1>
```

- If roots are imaginary, print:

```
root1 = <RealPart>+<ImaginaryPart>i
root2 = <RealPart>-<ImaginaryPart>i
```

Sample Test Cases

quadratic...

```
1 import math
2
3 a, b, c = map(int, input().split())
4 D = b*b - 4*a*c
5 if D > 0:
6     root1 = (-b + math.sqrt(D)) / (2*a)
7     root2 = (-b - math.sqrt(D)) / (2*a)
8     print(f"root1 = {root1:.2f}")
9     print(f"root2 = {root2:.2f}")
10 elif D == 0:
11     root = -b / (2*a)
12     print(f"root1 = root2 = {root:.2f}")
13 else:
14     real_part = -b / (2*a)
15     imag_part = math.sqrt(-D) / (2*a)
```

Average time

0.003 s

2.83 ms

Maximum time

0.004 s

4.69 ms

3 out of 3 shown test case(s) passed

3 out of 3 hidden test case(s) passed

Test case 1

Expected output

1 5 6

root1 = 3.00

root2 = 2.00

Actual output

1 5 6

root1 = 3.00

root2 = 2.00

Test case 2

Terminal

Test cases

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Reset

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