

1. Solving a quadratic equation

Nomor 2

```
#include <iostream>
#include <cmath> // it's for sqrt() function
using namespace std;

int main() {
    double a, b, c;
    cout << "Enter coefficients a, b, and c: ";
    cin >> a >> b >> c; //

    // Calculate the discriminant
    double discriminant = b * b - 4 * a * c;

    // Check the discriminant and calculate roots accordingly
    if (discriminant > 0) {
        // Two distinct real roots
        double x1 = (-b + sqrt(discriminant)) / (2 * a);
        double x2 = (-b - sqrt(discriminant)) / (2 * a);
        cout << "The equation has two distinct real roots: " << endl;
        cout << "x1 = " << x1 << endl;
        cout << "x2 = " << x2 << endl;

    } else if (discriminant == 0) {
        // One real root
        double x = -b / (2 * a);
        cout << "The equation has one real root: " << std::endl;
        cout << "x = " << x << endl;

    } else {
        // No real roots, complex roots
        double realPart = -b / (2 * a);
        double imaginaryPart = sqrt(-discriminant) / (2 * a);
        cout << "The equation has complex roots: " << endl;
        cout << "x1 = " << realPart << " + " << imaginaryPart << "i" <<
endl;
        cout << "x2 = " << realPart << " - " << imaginaryPart << "i" <<
endl;
    }

    return 0;
}
```

Output:

Real and Distinct Roots

A = 1, B = 3, C = -10

```
Enter coefficients a, b, and c: 1 3 -10
The equation has two distinct real roots:
x1 = 2
x2 = -5
```

Real and Equal Roots

A = 1, B = 2, C = 1

```
Enter coefficients a, b, and c: 1 2 1
The equation has one real root:
x = -1
```

Complex Roots

A = 1, B = 2, C = 5

```
Enter coefficients a, b, and c: 1 2 5
The equation has complex roots:
x1 = -1 + 2i
x2 = -1 - 2i
```