```cpp
#include <iostream>
#include <cmath>
using namespace std;

double cube_root( double x )
{
    double y = pow( abs( x ), 1.0/3.0 );
    if ( x < 0 ) y = -y;
    return( y );
}

int main()
{
    double a, b, c, d;
    double p, q, D, alpha, beta, theta;
    double a3, b3;
    double x1, x2, x3, y;

    cout << "To find the solutions of ax^3+bx^2+cx+d=0" << "\n\n";
    cout << "Enter a, b, c, & d" << "\n";
    cout << "a = "; cin >> a;
    cout << "b = "; cin >> b;
    cout << "c = "; cin >> c;
    cout << "d = "; cin >> d;
    cout << "\n\n";
    if ( a == 0 ) {
        cout << "Your equation is not cubic!\n\n";
        return( 0 );
    }
    cout << "The solutions are:" << "\n";

    p = ( 3*a*c - b*b ) / ( 9*a*a );
    q = ( 9*a*b*c - 2*b*b*b - 27*a*a*d ) / ( 54*a*a*a );
    D = pow( p, 3 ) + pow( q, 2 );

    if ( D > 0 ) {   // One real and two complex conjugates
        alpha = q + sqrt( D );
        beta = q - sqrt( D );
        a3 = cube_root( alpha );
        b3 = cube_root( beta );
        x1 = a3 + b3 - b / ( 3*a );
        x2 = -0.5 * ( a3 + b3 ) - b / ( 3*a );  // Real part of solution
        y = sqrt( 3.0 ) / 2 * ( a3 - b3 );  // Imaginary part of solution
        cout << "x1 = " << x1 << '\n';
        cout << "x2 = " << x2 << " + " << y << " i" << '\n';
        cout << "x3 = " << x2 << " - " << y << " i" << '\n';
    }
    else if ( D == 0 ) {   // Three real (at least two are equal)
        alpha = q;
        beta = q;
        a3 = cube_root( alpha );
        b3 = cube_root( beta );
        x1 = a3 + b3 - b / ( 3*a );
        x2 = -0.5 * ( a3 + b3 ) - b / ( 3*a );
        cout << "x1 = " << x1 << '\n';
```

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56:         cout << "x2 = " << x2 << '\n';
57:         cout << "x3 = " << x2 << '\n';
58:     }
59:     else {   // Three real
60:         theta = acos( q / sqrt( -p*p*p ) );
61:         x1 = 2 * sqrt( -p ) * cos( theta / 3.0 ) - b / ( 3*a );
62:         x2 = 2 * sqrt( -p ) * cos( theta / 3.0 + 2*M_PI / 3.0 ) - b / ( 3*a );
63:         x3 = 2 * sqrt( -p ) * cos( theta / 3.0 + 4*M_PI / 3.0 ) - b / ( 3*a );
64:         cout << "x1 = " << x1 << '\n';
65:         cout << "x2 = " << x2 << '\n';
66:         cout << "x3 = " << x3 << '\n';
67:     }
68:
69:     return( 0 );
70: }
```