Solver for $ax^2+bx+c=0$
with real roots.

Throws 1) NoRoot if no
real root exists
2) NoSolution if
no solution exists

```
void QES(double a, double b, double c,
         double& root1, double& root2)
    throws NoRoot, NoSolution;
```

QES Test Plan

1. $a \neq 0$
   - 1.1 $b^2-4ac>0$ // Distinct Roots
   - 1.2 $b^2-4ac=0$ // Repeated Roots
   - 1.3 $b^2-4ac<0$ // No Root
2. $a=0$
   - 2.1 $b \neq 0$ // Single Root
   - 2.2 $b=0$
     - 2.2.1 $c \neq 0$ // NoSolution : <0,0,5>, <0,0,-1>, <0,0,72>
     - 2.2.2 $c=0$ // Infinite Roots

Test Cases!

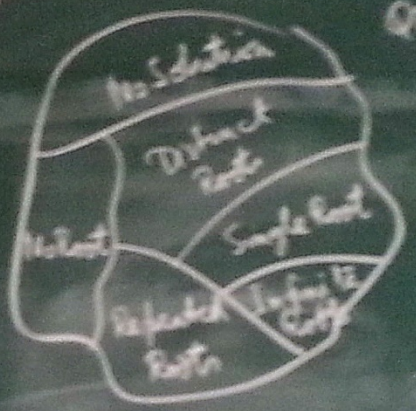
3. Precision Tests

$$abs\left(ax^2+bx+c\Big|_{root1}^{root2}\right) < \epsilon$$

```
void threeSort(int a, int b, int c) {
    if (a>b)
        if (b>c)
            cout << "a b c";
        else if (a>c)
            cout << "a c b";
        else
            cout << "c a b";
    else
        if (b>c)
            if (a>c)
                cout << "b a c";
            else
                cout << "b c a";
        else
            cout << "c b a";
}
```

Equivalence Classes & Testing

QES



(2,7,9)	9.7.2
(8,6,10)	10.8.6