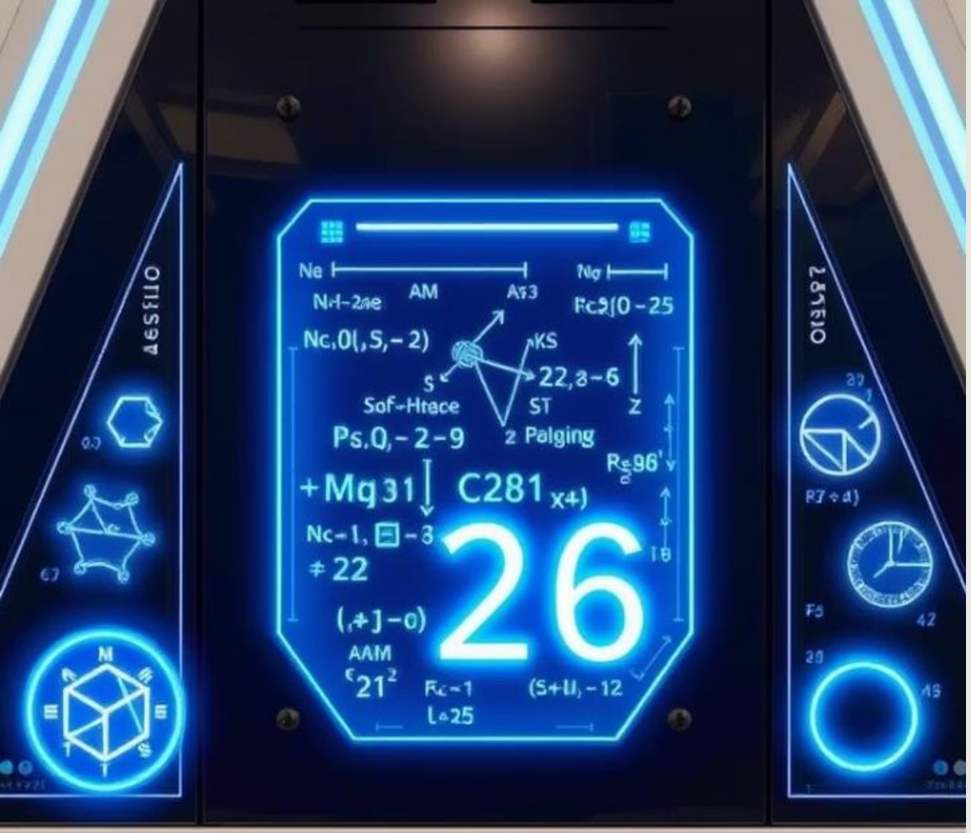


Introduction to the Equation Solver

Course: Introduction to Object-Oriented Programming

Group Project Topic: Equation Solver

Presented by: Alyona Avagyan, Milena Ghazaryan, Davit Avagyan

The Problem: Equation Solving is Hard

Manual Challenges

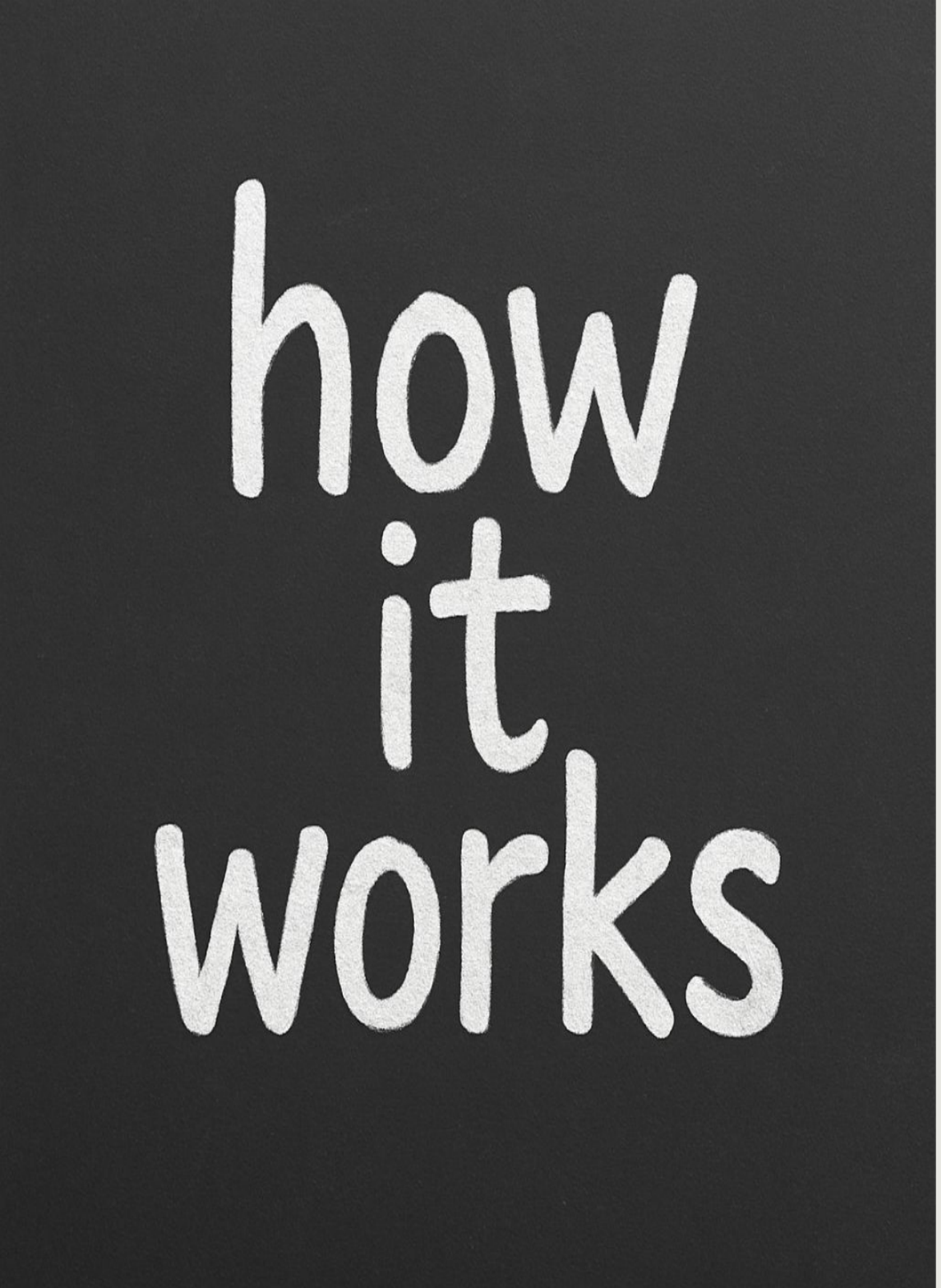
Time-consuming and error-prone, with up to 40% calculation mistakes.

Skill Barriers

Requires some knowledge about java to run the program and type a correct equation form.

Current Limitations

Existing tools often lack flexibility and ability to solve faster.



How It Works: The Engine

Equation Solver

This is the main class to run the whole program.

Equation Solver GUI

This is the graphical usage interface which shows the program's appearance.

Equation Parser

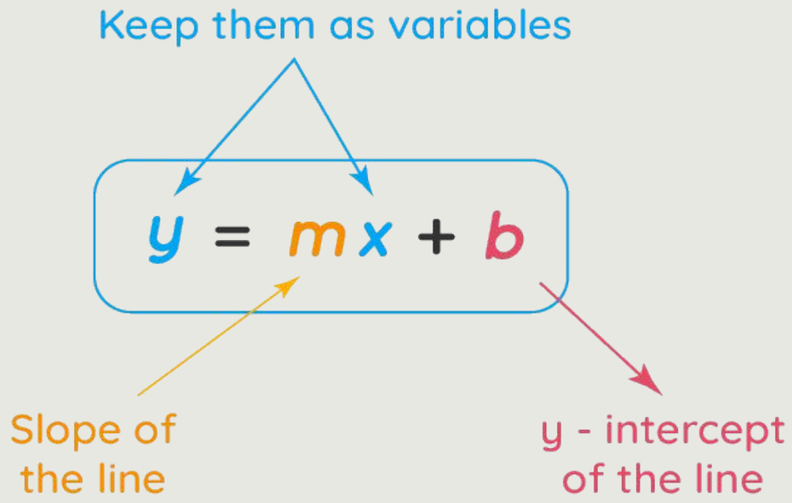
This is the very class which helps the program to parse the equation type by the user.

Linear Equation Solver and Quadratic Equation Solver

These two classes are the ones which determine the type of equation and typed by the user. They also need a parent class Equation which is an abstract class and the Result Formatter class to print the final result.

Mathematical interpretation

Linear Solving

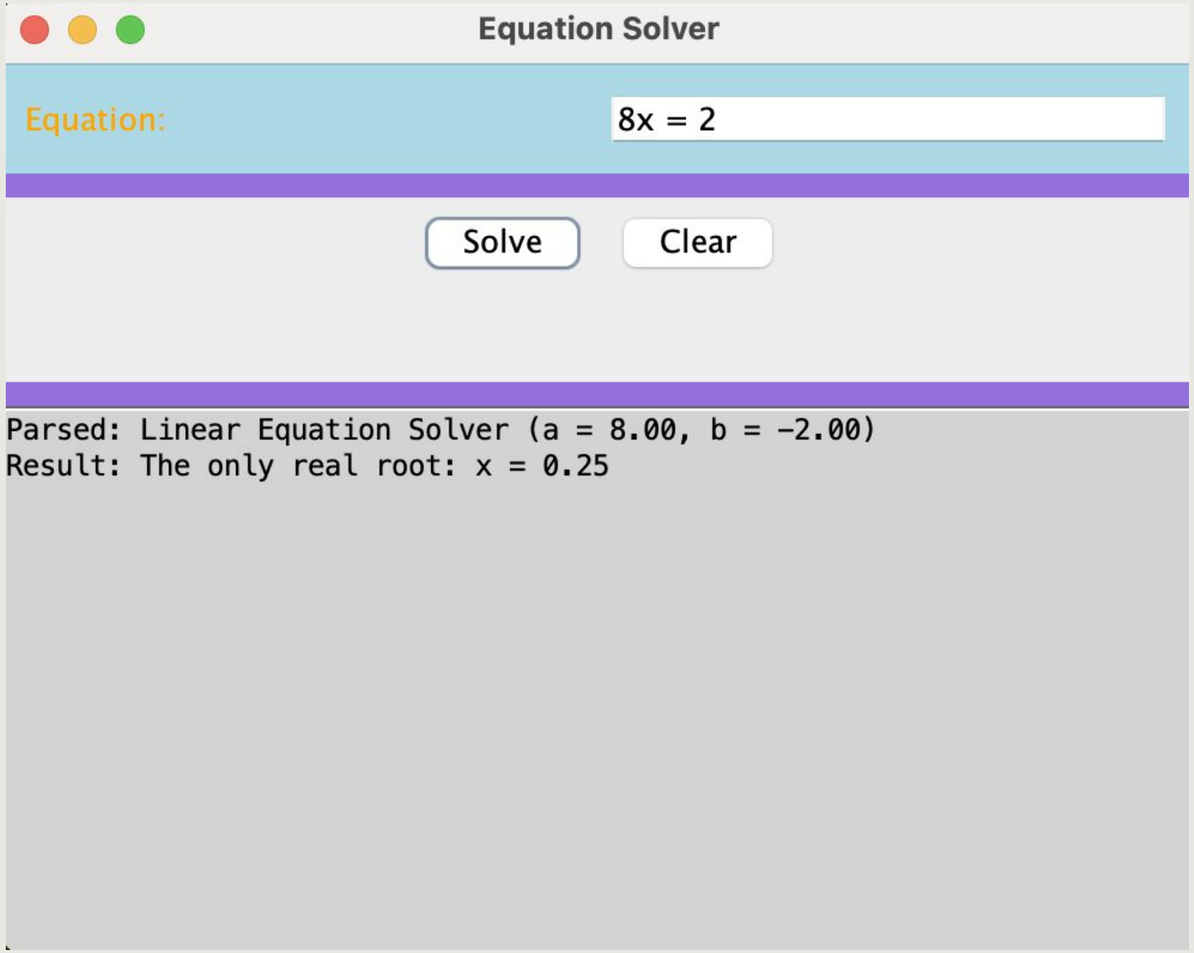


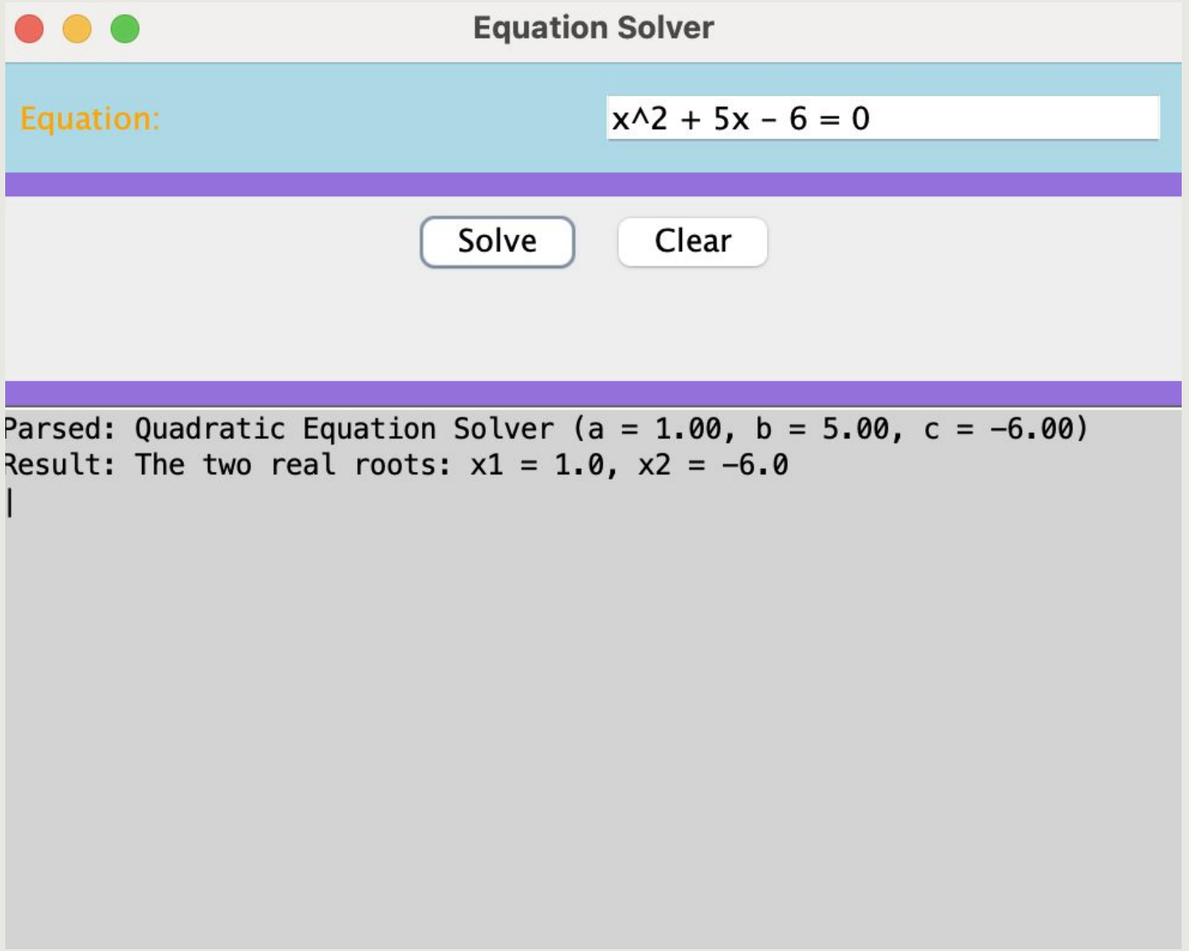
Quadratic Solving

$$ax^2 + bx + c = 0$$

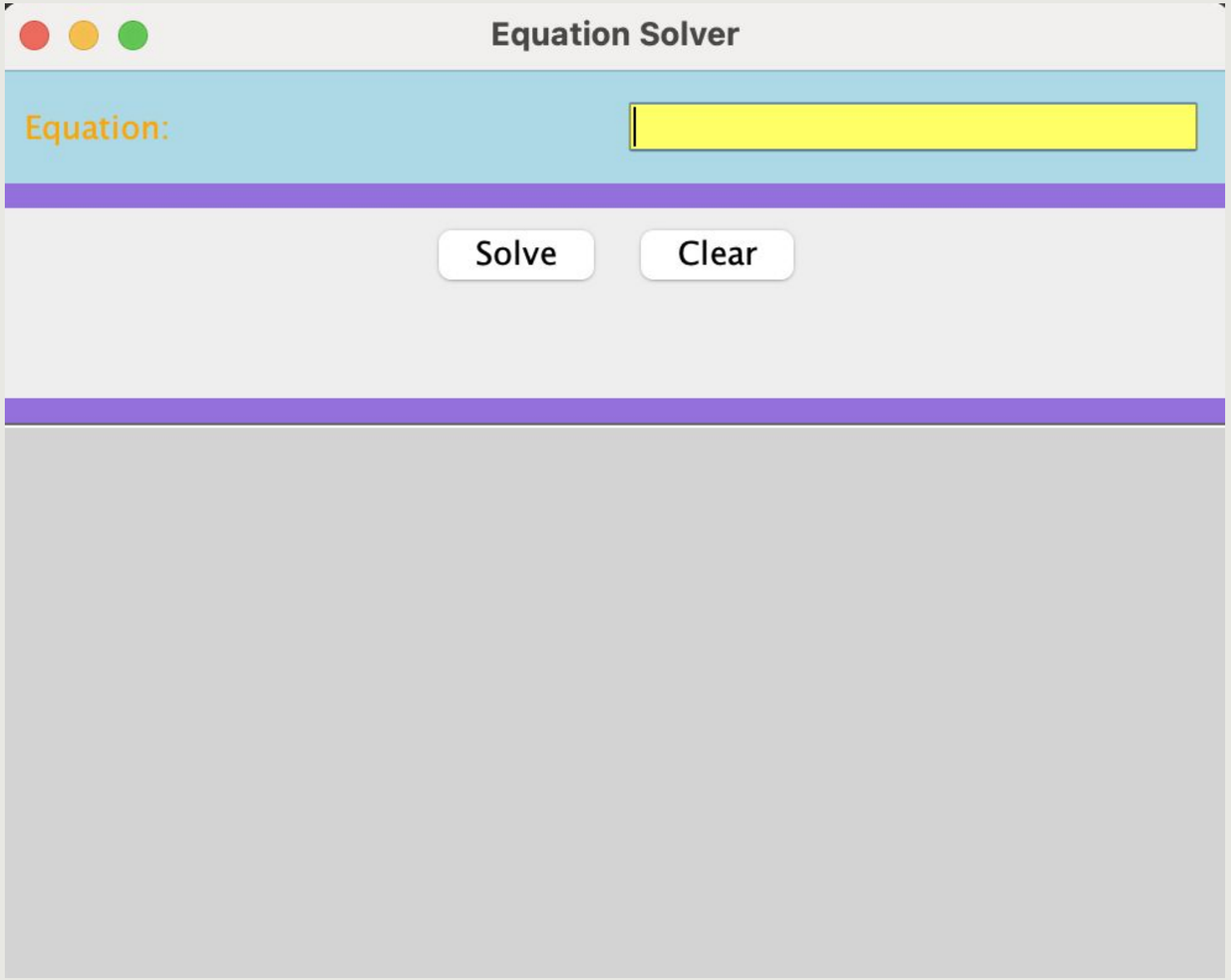
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

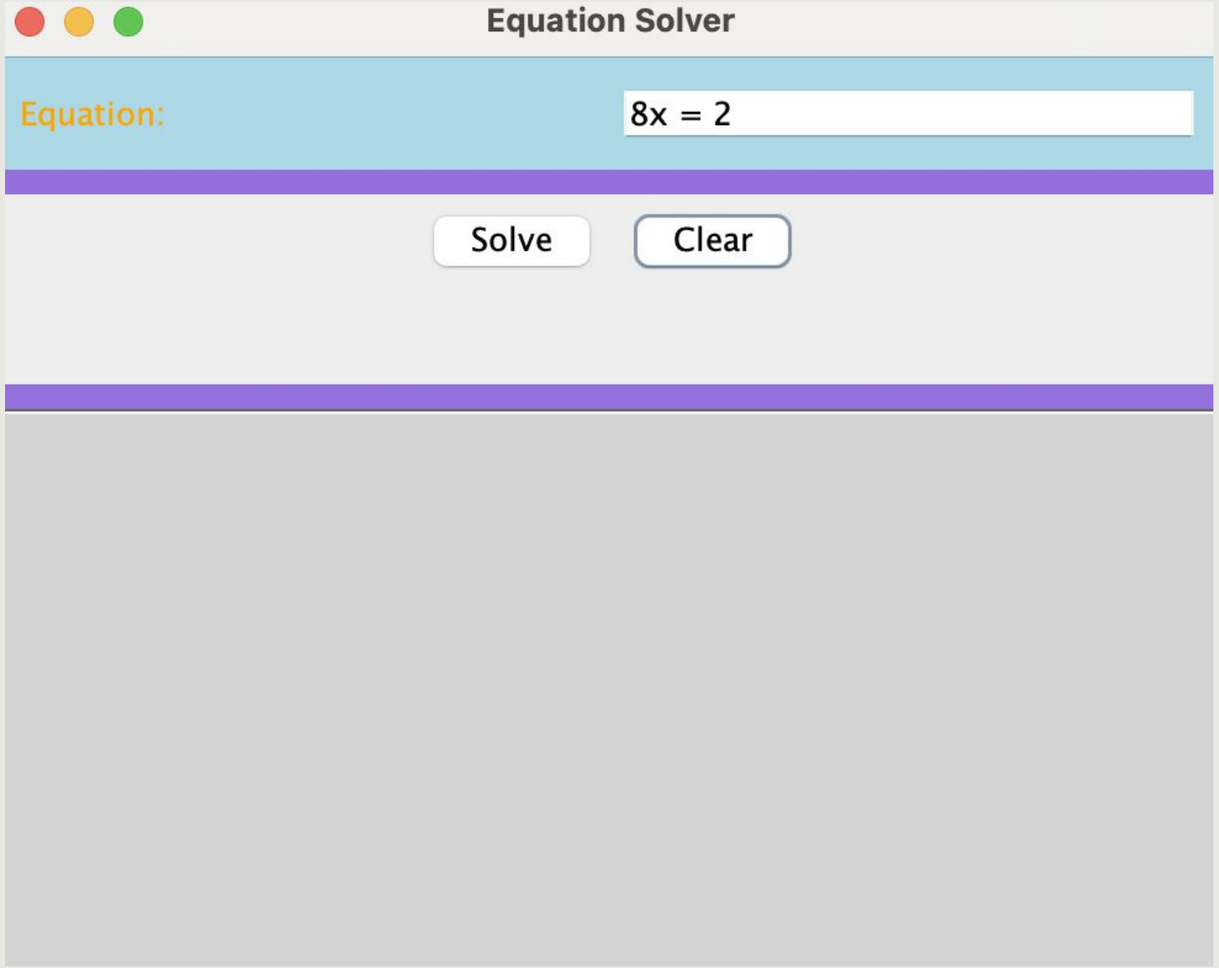
GUI


Equation Solver
Equation:
8x = 2
Solve
Clear
Parsed: Linear Equation Solver (a = 8.00, b = -2.00)
Result: The only real root: x = 0.25


Equation Solver
Equation:
x^2 + 5x - 6 = 0
Solve
Clear
Parsed: Quadratic Equation Solver (a = 1.00, b = 5.00, c = -6.00)
Result: The two real roots: x1 = 1.0, x2 = -6.0

GUI


Equation Solver
Equation:
Solve
Clear


Equation Solver
Equation:
8x = 2
Solve
Clear

THANK YOU!