Chapter 1 Programming Assignments

褚朱钇恒 **3200104144**

1 Programming Assignments

1.1 A

The abstract base class and three method is in EquationSolver.h.

1.2 B

1.2.1 $x^{-1} - \tan(x) = 0$

$root = 0.860333589$ $f(root) = 0.000000000$

1.2.2 $\frac{1}{x} - 2^x = 0$

$root = 0.641185745$ $f(root) = 0.000000000$

1.2.3 $2^{-x} + e^x + 2cos(x) - 6 = 0$

$root = 1.829383602$ $f(root) = 0.000000000$

1.2.4 $\frac{x^3+4x^2+3x+5}{2x^3-9x^2+18x-2} = 0$

$root = 0.117876567$ $f(root) = 6092072270288133.000000000$
This root is wrong, because bisection method found the root of the denominator.

1.3 C

$x - tan(x) = 0$
$root_1 = 4.493409458$ $f(root_1) = -0.000000000$
$root_2 = 7.725251837$ $f(root_2) = 0.000000000$

1.4 D

1.4.1 $sin(\frac{x}{2} - 1 = 0$

$root = 3.141592628$ $f(root) = 0.000000000$

1.4.2 $\frac{1}{x} - 2^x = 0$

$root = 1.306326940$ $f(root) = 0.000000000$

1.4.3 $2^{-x} + e^x + 2cos(x) - 6 = 0$

$root = -0.188685403$ $f(root) = 6092072270288133.000000000$

1.5 E

Three methods' got the same result 0.166166035.

1.6 F

1.6.1 a

$\alpha = 32.972174822°$

1.6.2 b

$\alpha = 33.168903820°$

1.6.3 c

The program got $\alpha = 528.5°$, because the original equation has infinite solutions in the real number field.