

File - lab14

```
/Users/rekerok/Proga/Numerical-methods/venv/bin/python /Users/rekerok/Proga/Numerical-methods/Lab14/lab14.py
```

Численное решение с помощью метода R - K, $r = 1$

Вычисления для первой задачи Коши

```
x_i = 0.5    z_xi = 0    s_xi = 0
x_i = 0.60000000000000001    z_xi = 0.0    s_xi = 0.8
x_i = 0.70000000000000001    z_xi = 0.08000000000000002    s_xi = 1.8666666666666667
x_i = 0.8    z_xi = 0.26666666666666667    s_xi = 3.21285140562249
x_i = 0.9    z_xi = 0.5879518072289157    s_xi = 4.856468297432153
x_i = 1.0    z_xi = 1.073598636972131    s_xi = 6.81937768207402
```

Вычисления для второй задачи Коши

```
x1_i = 0.5    z1_xi = 0    s1_xi = 1
x1_i = 0.60000000000000001    z1_xi = 0.1    s1_xi = 1.4
x1_i = 0.70000000000000001    z1_xi = 0.24    s1_xi = 1.8836158192090393
x1_i = 0.8    z1_xi = 0.4283615819209039    s1_xi = 2.4603459844219486
x1_i = 0.9    z1_xi = 0.6743961803630988    s1_xi = 3.1403357505154514
x1_i = 1.0    z1_xi = 0.988429755414644    s1_xi = 3.93418759579833
x1_i = 1.1    z1_xi = 1.381848514994477    s1_xi = 4.852815749013281
```

Вычисления для третьей задачи Коши

```
x2_i = 0.5    z2_xi = 1    s2_xi = 0
x2_i = 0.60000000000000001    z2_xi = 1.0    s2_xi = 0.17777777777777778
x2_i = 0.70000000000000001    z2_xi = 1.0177777777777777    s2_xi = 0.40652856246076585
x2_i = 0.8    z2_xi = 1.0584306340238543    s2_xi = 0.6861780185039323
x2_i = 0.9    z2_xi = 1.1270484358742476    s2_xi = 1.0180908010123177
x2_i = 1.0    z2_xi = 1.2288575159754793    s2_xi = 1.4047671422869923
```

```
A = [[1.    0.    ]
      [6.23466426 3.21890247]]
B = [ 0.5    -6.89297632]
```

$1.0 \cdot c_1 + 0.0 \cdot c_2 = 0.5$

$6.234664264007758 \cdot c_1 + 3.2189024697453 \cdot c_2 = -6.89297631904615$

$c_1 = 0.49999999999999998$

$c_2 = -3.109851430771094$

Вычисление $y(x)$

```
x_i = 0.5    y_xi = -3.109851430771094
x_i = 0.60000000000000001    y_xi = -3.109851430771094
x_i = 0.70000000000000001    y_xi = -3.0298514307710938
x_i = 0.8    y_xi = -2.843184764104427
x_i = 0.9    y_xi = -2.5218996235421782
x_i = 1.0    y_xi = -2.0362527937989627
```

Проверка:

$|0 \cdot -3.109851430771094 + 1 \cdot 0.0 - 0.5| = 0.5$

$|1 \cdot -2.0362527937989627 + 1 \cdot 4.856468297432155 - 1| = 1.8202155036331922$

Process finished with exit code 0