Integral Equations in Visual Computing Summer term 2008

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Assignment C1

(classroom assignment)

Problem 1:

Verify that $u(x) = \sin(x)$ is a solution of the integral equation

$$u(x) = x - \int_0^x (x - t) u(t) dt$$
.

Problem 2:

Transform the IVP

$$u'(x) = u^2(x), \quad u(0) = 4$$

into an integral equation.

Is this integral equation linear?

Problem 3:

Solve the IVP

$$y' = 2xy, \quad y(0) = c$$

with the iterative method of Picard-Lindelöf.