

Exercise 2

Classify the following equations as Fredholm, or Volterra, linear or nonlinear, and homogeneous or inhomogeneous

$$u(x) = \cosh x + \int_0^1 (x - t)u(t) dt$$

Solution

This is a Fredholm integral equation because both limits of integration are constant. It is linear because the exponent of u is 1 wherever it appears in the equation. It is inhomogeneous because of $\cosh x$ on the right side in front of the integral.