Week 2 (1-D Heat Equation)

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One-Dimensional Heat Equation

We will model steady heat transfer in the 1D domain $\Omega = (0, c)$ using the ODE

$$\rho(x)c_p(x)u(x)\frac{\partial T(x)}{\partial x)} - \frac{\partial}{\partial x}\left(k(x)\frac{\partial T}{\partial x}(x)\right) = f(x)$$

With Dirichlet boundary conditions

$$T(0) = T_0,\ T(c) = T_c,\ T(x, 0) = T_0(x) \quad x \in (0, c)$$