Transient heat conduction provides many inverse problems. Some are
determination of certain parameters such as thermal conductivity and volumetric
heat capacity. We term these parameter estimation problems. In other cases
functions are needed such as the heat fluxes at boundaries, the volumetric
energy generation distributed in a body and the initial temperature distribution.
These are called function estimation problems. Green’s functions provide a
framework for illustrating these problems in a general but comprehensive way.
The subject of Green’s functions for transient heat conduction is reviewed and
applications are made to the parameter and function estimation problems. The
discussion is mainly about problems that are usually termed “linear” because
they are linear in terms of the independent variable, which is temperature;
however, but the parameter estimation problems, although linear in the
temperature, are usually nonlinear in terms of the parameters.