Problem 23:

The surface of a unit sphere is illuminated with a beam of radiation so that the surface temperature is $T(1, \phi, \theta) = \sin^2 \theta$. By requiring that the temperature remain finite, find the steady-state temperature profile, $T(r, \phi, \theta)$, within the sphere.

Problem 24:

Determine the flow pattern of an incompressible, non-viscous fluid as it flows over a long cylinder of unit radius that is perpendicular to the flow, as shown in the accompanying figure below:

The flow of a fluid around a cylindrical obstacle that is perpendicular to the flow.
Problem 25:

A long hollow metal bar has the constant eccentric cross-section shown below. Along the entire length of the bar, the interior surface of the cylinder is held at a constant temperature $T_1$ and the exterior surface is held at a constant temperature $T_2$. Find the temperature profile of the hollow metal bar.