

4. (25 points.) Apply a "finite-volume" or the "control-volume" method to discretize the following model equation

$$\rho \left[u \frac{\partial T}{\partial x} \right] = f + \frac{\partial}{\partial x} \left[K \frac{\partial T}{\partial x} \right]$$

Where f and u are known functions at all grid points; ρ is constant and K is the thermal conductivity.