PROBLEM 1.9

A SHALLOW RIVER FLOWS OUT OF A SHADED, WOODED REGION INTO AN OPEN PLAIN AT $X=0$. ONCE IN THE OPEN REGION ($X>0$) THE RIVER BEGINS TO RECEIVE SOLAR RADIATION AT $H_S = 800$ WATTS m^{-2}. IF THE RIVER EMERGES FROM THE FOREST AT A CONSTANT TEMPERATURE, T_o, FIND THE GRADIENT OF TEMPERATURE ALONG THE RIVER, $\partial T/\partial X$, FOR $X > 0$. THE RIVER IS $h = 1$ m DEEP, $b = 10$ m WIDE AND FLOWS AT $U = 1\ ms^{-1}$. THE DIFFUSION COEFFICIENT IS HOMOGENEOUS AND ISOTROPIC, $D = 0.1\ m^2 s^{-1}$