

Exercise 7

Let D be the semidisk $\{x^2 + y^2 < b^2, y > 0\}$. Consider the diffusion equation in D with the conditions: $u = 0$ on bdy D and $u = \phi(r, \theta)$ when $t = 0$. Write the complete expansion for the solution $u(r, \theta, t)$, including the formulas for the coefficients.