KF

Math 301 (072)
Quiz 3 (Ch 13 & 14)

Name: ID #: Section #: Serial #:

Solve the following boundary-value problem for the steady-state temperature $u(r,\theta)$ in the semicircular plate $0 \le \theta \le \pi$, $0 \le r \le 2$:

$$u_{rr} + \frac{1}{r}u_r + \frac{1}{r^2}u_{\theta\theta} = 0, \quad 0 < \theta < \pi, \quad 0 < r < 2$$

$$u(2,\theta) = 5, \qquad 0 < \theta < \pi$$

$$u_\theta(r,0) = 0, \quad u_\theta(r,\pi) = 0, \quad 0 < r < 2$$