

CLASSICAL ELECTRODYNAMICS I

Homework Set 5

February 24, 2017

1. Consider a two-dimensional pie-shaped region, $0 \leq r \leq R$, $0 \leq \theta \leq \beta$, which is bounded by conducting surfaces. The straight sections at $\theta = 0$ and $\theta = \beta$ are held at potential V and the circular arc at $r = R$ is held at potential $V + \Delta V$. [Small insulators are located at $(r, \theta) = (R, 0)$ and (R, β) .]
 - (a) Solve the Laplace equation in the enclosed region to determine the electrostatic potential in the form of an infinite series.
 - (b) Next introduce an appropriate complex variable to sum the series and give the potential in closed form.