


4. Solve $\Delta u = 0$ in the disk $\{r < a\}$ with the boundary condition

   $u = 2 + 3 \sin(\theta)$

   on the boundary $r = a$.

5. Let

   $$P_r(\theta) = \sum_{n=-\infty}^{\infty} r^{|n|} e^{in\theta}$$

   be the Poisson kernel on $0 \leq r < 1$, $-\pi \leq \theta \leq \pi$. Show that $P_r(\theta)$ is an approximate identity as $r \to 1$. 