MAT 201B Homework 5
Winter 2020
Professor Qinglan Xia
Due Date: Monday, February 10th at 11:30pm

1. Exercise 7.4 in the textbook "Applied Analysis", page 183.
2. Exercise 7.5 in the textbook "Applied Analysis", page 184.
3. Exercise 7.6 in the textbook "Applied Analysis", page 184.
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 $r \to 1$.