Math 3363
Homework Problem assigned September 6, 2019, due September 11.

Let $u(\theta,t)$ solve:
$$\frac{\partial u}{\partial t}=\frac{\partial^2 u}{\partial \theta^2},\quad -\pi<\theta<\pi,\ 0<t,\quad u(\theta,0)=|\theta|,\quad -\pi<\theta<\pi,$$
$$u(-\pi,t)=u(\pi,t),\quad \frac{\partial u}{\partial \theta}(-\pi,t)=\frac{\partial u}{\partial \theta}(\pi,t),\ 0<t$$

a. Solve for $u(\theta,t)$.

b. Find $\lim_{t\to\infty} u(\theta,t)$ (Don't' worry about the type of convergence).