Math 309 Quiz 4

May 19, 2017

Problem 1. TRUE or BANANAS. If $f(x) \in \mathcal{P}_T$ is even and periodic, then the coefficients of the sines (b_m's) in its Fourier series will all be 0.

Problem 2. TRUE or BANANAS. If $f(x)$ is periodic with period T and $g(x)$ is periodic with period $\widetilde{T}$, then $f(x) + g(x)$ will also be periodic.
BONUS: If TRUE, write the period of $f(x) + g(x)$. If BANANAS, give a counter-example.

Problem 3. Calculate the Fourier series of

$$f(x) = \begin{cases} 0 & -L \leq x < 0 \\ 1 & 0 \leq x < L \end{cases} \quad f(x + 2L) = f(x).$$