

Name: Solution

MATH 19 QUIZ
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1. Find the Fourier series for the function $f(x) = \sin 44x$.

$$a_0 = \frac{1}{2\pi} \int_0^{2\pi} \sin 44x \, dx = 0$$

$$a_n = \frac{1}{\pi} \int_0^{2\pi} \cos nx \sin 44x \, dx = 0$$

$$b_n = \frac{1}{\pi} \int_0^{2\pi} \sin nx \sin 44x \, dx$$

$$= \begin{cases} 0 & \text{if } n \neq 44 \\ \frac{1}{\pi} \cdot \pi & \text{if } n = 44. \end{cases}$$

So the Fourier series is $b_{44} \sin 44x = \boxed{\sin 44x}$