EXERCISE C.12: Use Parseval's Theorem to complete the proof of the famous formula:

$$\frac{\pi^2}{M} = \sum_{k=1}^{\infty} \frac{1}{k^2}$$

by finding the numerical value of the integer M. In the history of mathematics, this was known as the Basel problem, which was solved by Euler in 1735.

`http://en.wikipedia.org/wiki/Basel_problem`

Hint: use Parseval's Theorem with the square wave and its Fourier series coefficients.