

Homework 5
Solutions

- 14.2(a) Using the definition of the Fourier series one should be able to show that the Fourier sine series of $f(x) = x(1 - x)$ is

$$\sum_{k=1}^{\infty} \frac{8}{[(2k+1)\pi]^3} \sin(2k+1)\pi x.$$

- 14.6(b) Using the formula (14.7) on page 108, mimicking the Example 14.5, and implementing the Fourier series of $f(x) = x(1 - x)$ derived in the previous problem, we obtain, comparing term by term, that:

$$u(x, t) = \sum_{k=1}^{\infty} \frac{8}{[(2k+1)\pi]^4} \sin[(2k+1)\pi t] \sin[(2k+1)\pi x].$$