2BA1: Maths for Students in Computer Science
Tutorial work, February 20, 2008

1. (a) Find the general solution for the equation

$$f''(x) - 5f'(x) + 4f(x) = e^x.$$

(b) Solve this equation for $f(x)$ with the boundary data $f(0) = 0$, $f(1) = e$.

2. Use your favourite programming language to write a program that computes the first four decimal points of $f(1)$, where $f(x)$ is uniquely determined from

$$f'(x) = 0.5\sin(f(x)) + 0.1x,$$
$$f(0) = 0.$$

3. Find the Fourier series on the interval $[-\pi, \pi]$ for the function $f(x) = x^2$.