Physics 129a
Problem Set Number 3
Due Wednesday, October 24, 2007

Reading: The course note on "Hilbert Spaces" on the web. Also, chapter 6 of Mathews and Walker provides a review of finite-dimensional vector spaces and operators, with a brief introduction to inifinite dimensions in section 6-7.

10. Integral equation practice: Exercise 19 in the Integral Equations course note.

11. A Volterra's equation: Exercise 20 in the Integral Equations course note.

12. Some more Volterra's equations: Solve for $f(x)$ in the following two cases –

    (a) $f(x) = \sin x + \cos x + \int_0^x \sin(x-y) f(y)\, dy$,

    (b) $f(x) = e^{-x} + 2x + \int_0^x e^{y-x} f(y)\, dy$.

13. Exercise on topology: Exercise 1 in the Hilbert Spaces course note.

14. Exercise on topology: Exercise 2 in the Hilbert Spaces course note.