Problem Set 10

Physics 212: Spring 2008

Handed out:	Thursday, April 10, 2008
Due in class:	Tuesday, April 15, 2008
Total Marks:	20

Problem 1

Problem 19.3.1, 19.3.2, 19.3.3.

5 marks each

Problems 2

Consider a particle of mass m in one dimension which can only exist in half the space $x < 0$. It encounters an infinite potential at $x = 0$. Let H_0 be the free particle Hamiltonian in the half space. Find

$$G(x, x') = \frac{\hbar^2}{2m} \langle x | \frac{1}{E_0 - H_0 + i\varepsilon} | x' \rangle$$

and argue that this is indeed the correct Green's function for studying scattering.

[Hint: Now the complete set of energy eigenstates are $\psi_k(x) = \sqrt{2/\pi}\sin(kx)$,for all $k > 0$.]

5 marks