1. Calculate the probability current density **j** for free particle in periodic one dimensional space.

2. What does the Schrödinger equation(s) and the continuity condition(s) looks like for the tunneling effect in the case $E < U_0$? Derive equations.

3. Probability of inter level transitions for first order of perturbation theory approximation in case of harmonic external perturbation.

The "Fermi golden rule" of quantum mechanics. (derive)

Relationship between the "Fermi golden rule" and spectroscopy (intensity of spectral lines).

PS!

Calculate the energy dependences of reflection coefficient R(E) and transmition coefficient (T(E) for the stepped barrier in the case of $E < U_0$.