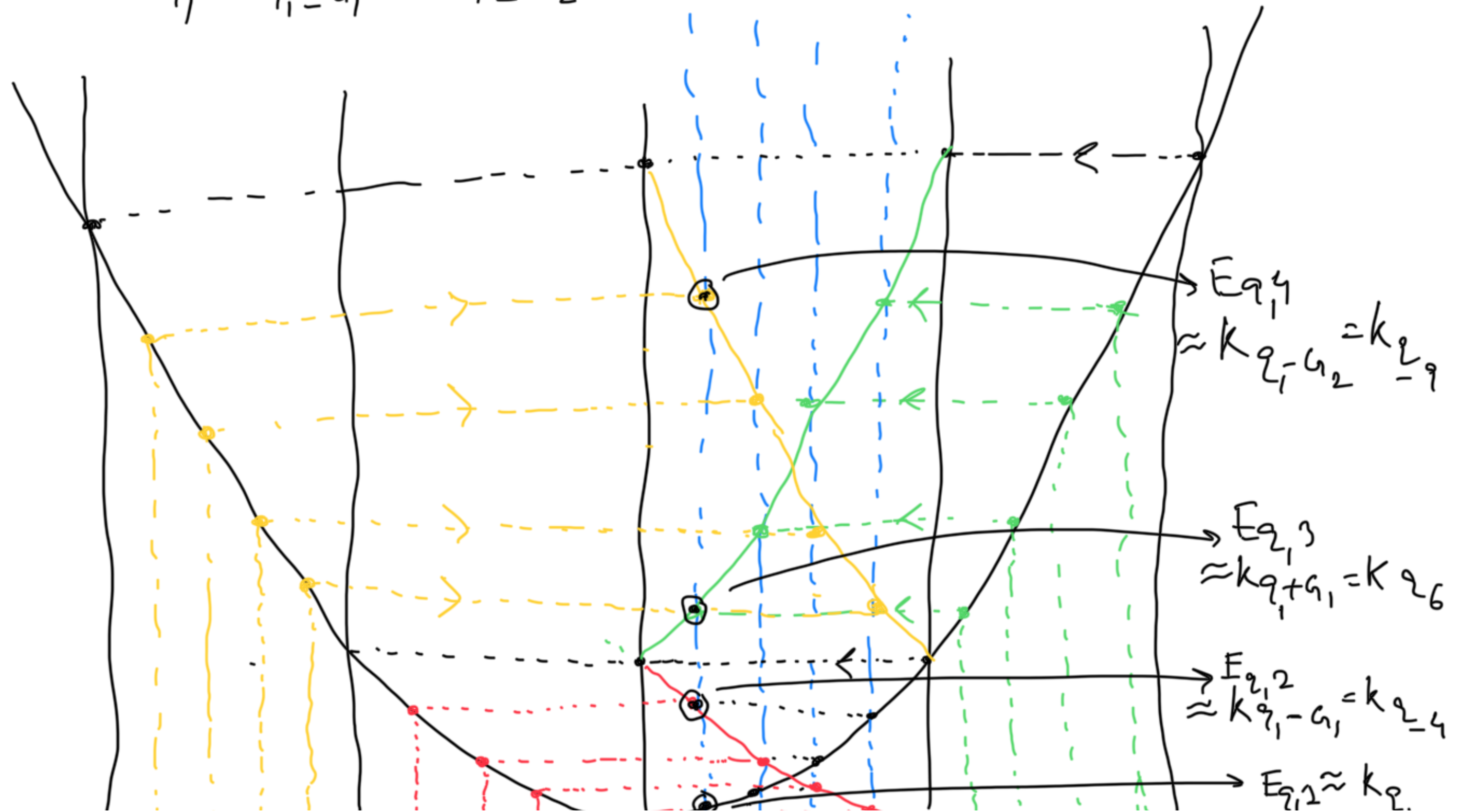


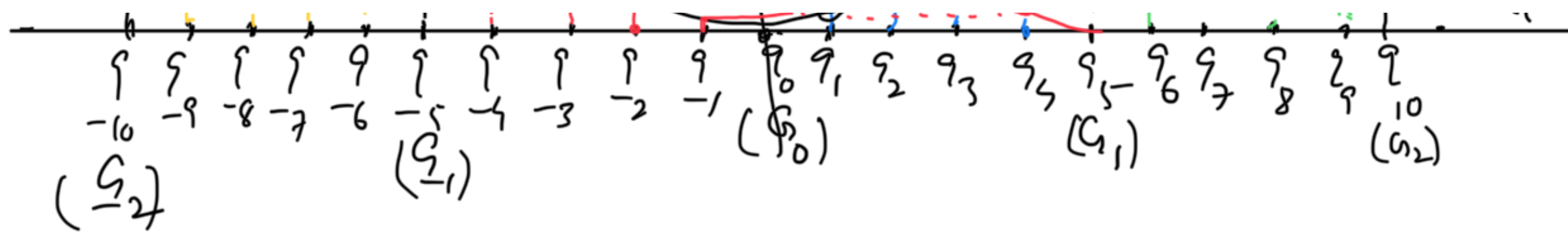
"Free" electron "band structure" (absurd in exact sense)

However we can think of it as an approximate scenario where $|V(x)| \rightarrow 0^+$ implying that the values A_q with unique Ψ_q lies within arbitrary interval $|G_1 - G_0|$ but energies are approximated to be same as free electron.

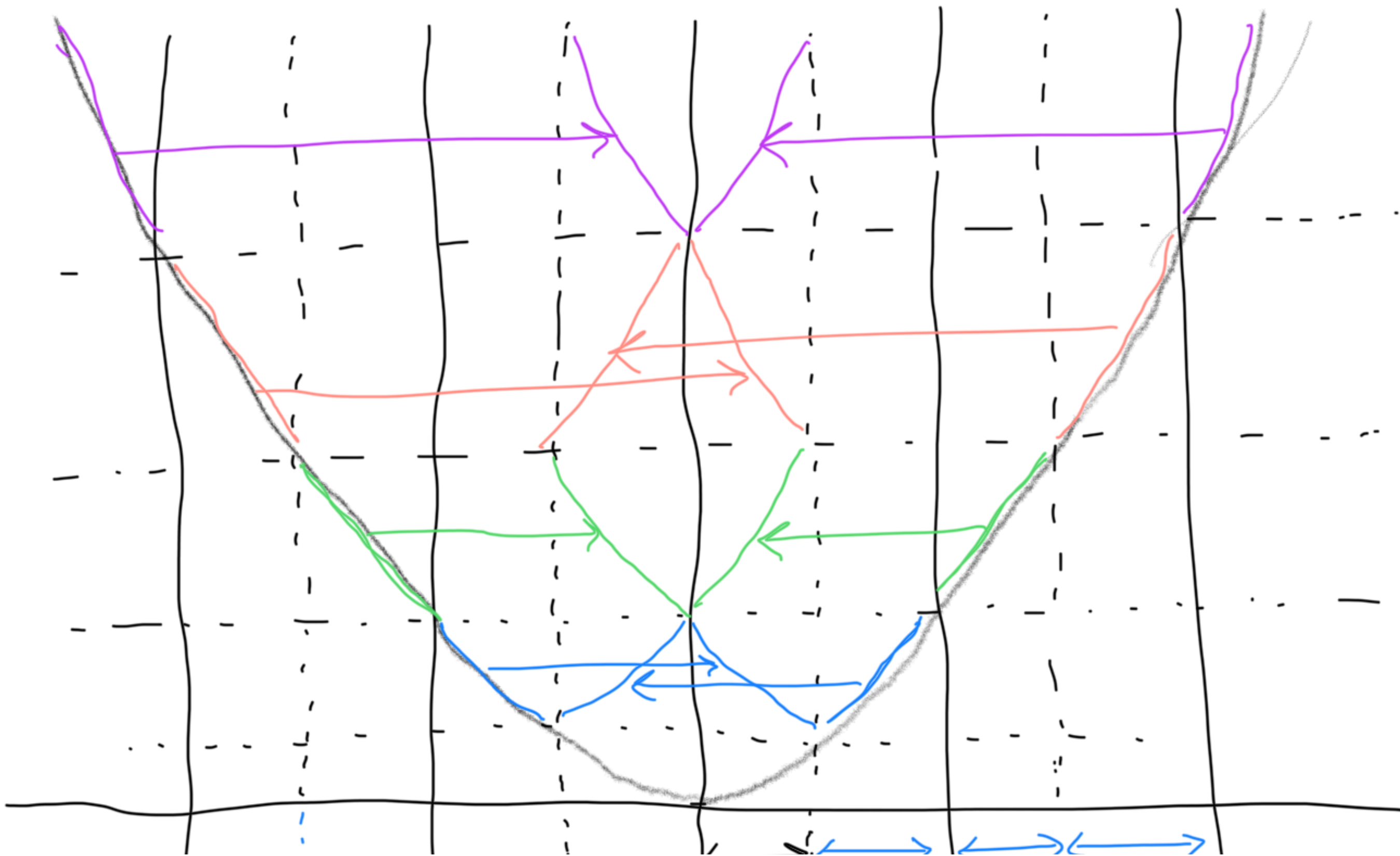
"Free" electron energy eigenvalues at for $q = q_1$

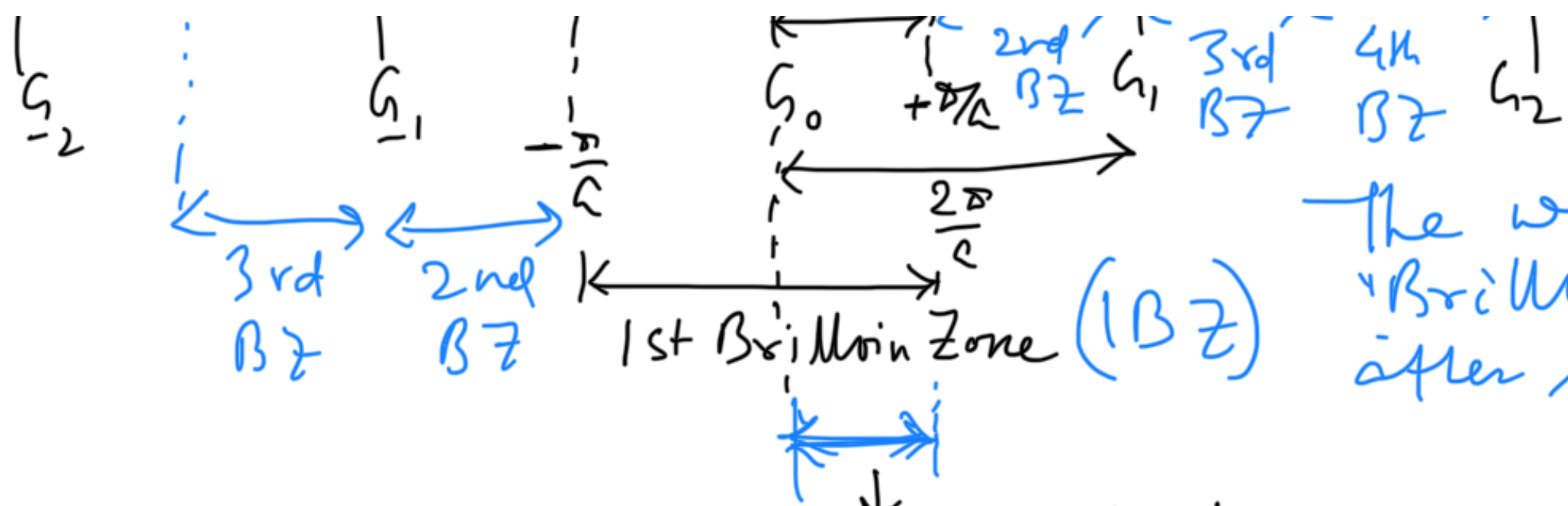
$$E = k_{q_1}, k_{q_1 \pm G_1}, k_{q_1 \pm G_2}, \dots, k_{q_1 \pm G_m}$$





Which implies:





Irreducible Brillouin Zone
 Has all the information about energy
 and "momentum" of electron.
 (time reversal symmetry is assumed here.)