Serbyn calculation in 1D

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$$Q(0,0) = -e^2 \frac{1}{2\beta} \sum_{\epsilon_n} \int \frac{dk}{2\pi} Tr\left[v^2 G(k, i\epsilon_n) G(k, i\epsilon_n)\right]$$

$$G(k, i\epsilon_n) = \left[(i\epsilon_n + i\Gamma)\tau_0\sigma_0 - (2w_0 cos(k) - \mu)\,\tau_z\sigma_0 + \Delta\tau_y\sigma_y\right]^{-1}$$

$$\epsilon_n - \epsilon^{(1)} = -\Gamma$$

$$\epsilon_n = 2\pi/\beta\left(n + \frac{1}{2}\right)$$

$$\Delta = \Delta^{(1)}$$