Consider the electron-photon vertex correction \( \delta F_1(q^2) \) and the electron self-energy correction \( \delta Z_2 \) at one loop in QED. Using dimensional regularization, and keeping track only of the ultraviolet (UV) and infrared (IR) divergent terms, show that:

1. \( \delta F_1(0) = -\delta Z_2 \);

2. the IR divergences in \( \delta F_1(q^2) - \delta F_1(0) = \delta F_1(q^2) + \delta Z_2 \) exactly cancel the corresponding divergences of the one-photon emission process: \( e^- \rightarrow e^- + \gamma \);

3. explain the meaning of the cancellations you have verified in points (1.) and (2.) above.