Exercise I

Ia) Derive equations (6) from (5)

Ib) Show that the time-dependent ratio of wrong-sign to right-sign $D^0 \to K\pi$ decays is given by

$$R(t) = \frac{N_{WS}(t)}{N_{RS}(t)} \approx R_d + \sqrt{R_D}\, y' \Gamma t + \frac{x^2+y^2}{4}(\Gamma t)^2$$

for small values of x and y.

Here, R_d is the ratio of decay rates of the doubly Cabibbo-suppressed to the Cabibbo-favoured mode:

$$R_d \equiv |A(D^0 \to K^+\pi^-)_{DCS}|^2 / |A(D^0 \to K^-\pi^+)_{CF}|^2$$