(3) δQ - REN FAKTORE INTEGRATZAILEA (2.ONDORIOAREN ONDORIOA)

$$\delta Q = dU - Y dX - Y' dX' \quad \left\{ \begin{array}{l} U = U(t,X,X') \\ Y = Y(t,X,X') \\ Y' = Y'(t,X,X') \end{array} \right\}$$

$$\sigma = \sigma(t,X,X') \implies t = t(\sigma,X,X')$$

$$\delta Q = \left(\frac{\partial U}{\partial \sigma}\right)_{X,X'} d\sigma + \left[\left(\frac{\partial U}{\partial X}\right)_{\sigma,X'} - Y\right] dX + \left[\left(\frac{\partial U}{\partial X'}\right)_{\sigma,X} - Y'\right] dX'$$

(i) $\quad d\sigma = dX = 0$
$\quad\quad dX' \neq 0$

(ii) $\quad d\sigma = dX' = 0$
$\quad\quad dX \neq 0$

$$\delta Q = \left(\frac{\partial U}{\partial \sigma}\right)_{X,X'} d\sigma$$

$$\lambda \equiv \left(\frac{\partial U}{\partial \sigma}\right)_{X,X'}$$

$$\delta Q = \lambda\, d\sigma \qquad\qquad \lambda = \lambda(\sigma,X,X')$$