2-5. Classically, the energy is defined as

$$E = \dot{x}p - L \tag{2.12}$$

Show that the energy at a final point is

$$\dot{x}_b \left(\frac{\partial L}{\partial \dot{x}}\right)_{x=x_b} - L(x_b) = -\frac{\partial S_{cl}}{\partial t_b} \tag{2.13}$$

while the energy at an initial point is

$$+\frac{\partial S_{cl}}{\partial t_a}$$

Hint: A change in the time of an end point requires a change in path, since all paths must be classical paths.

We have

$$\dot{x}_b = \left(\frac{dx}{dt}\right)_{t=t_b}$$