4) Si Verlet es simpléctico

$$J = 1$$

$$x_{n+1} = x_n + v_n \Delta t + \frac{1}{2} a_n \Delta t^2$$

$$v_{n+1} = v_n + \frac{1}{2} (a_{n+1} + a_n) \Delta t$$

$$J = \frac{\partial x_{n+1}}{\partial x_n} \frac{\partial v_{n+1}}{\partial v_n} - \frac{\partial x_{n+1}}{\partial v_n} \frac{\partial v_{n+1}}{\partial x_n}$$

$$J = 1 \cdot 1 - \Delta t \cdot 0 = 1$$