Ej 4

Verlet:

$$x(t+\Delta t) = x(t) + v(t)\Delta t + \frac{1}{2} a(t) \Delta t^2$$

$$v(t+\Delta t) = v(t) + \frac{1}{2} \left(a(t) + a(t+\Delta t) \right) \Delta t$$

0

$$x_{N+1} = x_N + v_N h + \frac{1}{2} a_N(t) h^2$$

$$v_{t+1} = v_N + \frac{1}{2} (a_N + a_{N+1}) h$$

$$J = \frac{\partial x_{N+1}}{\partial x_N} \frac{\partial v_{N+1}}{\partial v_N} - \frac{\partial x_{N+1}}{\partial v_N} \frac{\partial v_{N+1}}{\partial x_N} = 1$$

$$J = (1)(1) - (h)(0) = 1 \quad \checkmark$$