

a)

$$\frac{d\langle x \rangle}{dt} = \int x \frac{\partial}{\partial t} |\psi|^2 dx = \frac{i\hbar}{2m} \int x \frac{\partial}{\partial t} \left( \psi^* \frac{\partial \psi}{\partial x} - \frac{\partial \psi^*}{\partial x} \psi \right) dx \quad 1.29$$

The middle expression here is  $\int x \frac{\partial}{\partial t} |\psi|^2 dx$

This is not of the form  $\int v \cdot du$  because there is a partial derivative with respect to time which is integrated with respect to distance. If the partial derivative was with respect to distance, it's fair game for integration-by-parts.