Show that $\frac{d\langle p\rangle}{dt} = -\left\langle \frac{dV(x)}{dx} \right\rangle$ when a particle is subjected to a potential $\langle V(x)\rangle$.

The time derivative of the expectation value of the momentum is a known quantity, from
Time Dependence of Expectation Value of General Momentum Operator:

$$\frac{d\langle p\rangle}{dt} = \frac{1}{\iota\hbar}.$$

The problem is therefore reduced to finding whether $-\left\langle \frac{dV(x)}{dx} \right\rangle$ reduces to $\frac{1}{\iota\hbar}$.

$$-\left\langle \frac{dV(x)}{dx} \right\rangle = -\langle\Psi| \frac{d}{dx} V(x) |\Psi\rangle.$$

Viewing the expression in this form reveals a relationship between the space derivative and the operators V (x) and $|\Psi\rangle$. The chain rule allows this derivative to be computed.

$$-\langle\Psi| \frac{d}{dx} V(x) |\Psi\rangle = -\langle\Psi| \left(\frac{d}{dx} V(x)|\Psi\rangle + \frac{d}{dx} |\Psi\rangle V(x)\right).$$