Worksheet #11
(Wednesday, October 30, 2019)

Name

Questions (5 pts):

Consider a system whose initial state at \( t_0 = 0 \) is given in terms of eigenvectors of the (time-independent) Hamiltonian as follows:

\[
|\psi(0)\rangle = \frac{1}{\sqrt{2}}|\varphi_1\rangle + \frac{1}{2}|\varphi_2\rangle - \frac{1}{2}|\varphi_3\rangle.
\]

1) If the energies corresponding to \( |\varphi_1\rangle, |\varphi_2\rangle, |\varphi_3\rangle \) are \( E_1 \), \( E_2 \), and \( E_3 \), respectively, what is the state of the system \( |\psi(t)\rangle \) at any later time \( t \)?

2) How is the average energy at \( t = 0 \) compares to that at a later time \( t \)? Explain.