Assignment Questions:

1) A particle is in a stationary state with wavefunction $\psi(x,t) = \phi(x)e^{-iEt/\hbar}$. Show that the probability density $|\psi(x)|^2$ is time-independent. Also write what does this imply physically?

2) Find the normalization constant A, given that $\psi(x) = A\, e^{-\alpha x^2}, x \in (-\infty, \infty), \alpha > 0$