1. A harmonic oscillator of mass μ and spring constant k is in its ground state. At time $t = 0$ a constant force f is suddenly applied, i.e.

$$
\begin{aligned}
f(t) &= 0 \quad \text{for } t < 0 \\
&= f \quad \text{for } t > 0 \ .
\end{aligned}
\tag{0.1}
$$

a) What are the new energy eigenstates of the oscillator after the force has been applied?
b) What is the probability to find the oscillator in any of the new energy eigenstates?

2. Problems 18.2.4, 18.2.5, 18.4.3 and 18.4.4 in Shankar's book.