1. Consider a particle moving in a simple harmonic oscillator potential. The Hamiltonian is

\[ H = \frac{p^2}{2m} + \frac{1}{2}m\omega^2 x^2. \]

Use the WKB approximation to find the energy eigenvalues.

2. Consider a potential barrier of the following form

\[ V(x) = \begin{cases} 
0 & x < 0 \\
V_0 - Fx & 0 \leq x \leq V_0/F \\
0 & x > V_0/F 
\end{cases} \]

A particle with energy \( E < V_0 \) is moving towards the barrier, approaching \( x = 0 \) from the left. We will use the WKB approximation.

(a) Construct the WKB wave function.

(b) Compute the transmission coefficient.