Consider a step potential:

$$V(x) = \begin{cases} 0 & x < 0 \\ V_0 & x \geq 0 \end{cases}$$

A particle is incident on the step from the left. Model the particle as a single momentum eigenstate $e^{ip_0 x/\hbar}$.

1. For the case where $E < V_0$, what is:

   a) probability that the particle will be reflected by the step?

   b) the probability that the particle will be transmitted into the step?

2. For the case where $E > V_0$, what is:

   a) probability that the particle will be reflected by the step?

   b) the probability that the particle will be transmitted across the step?