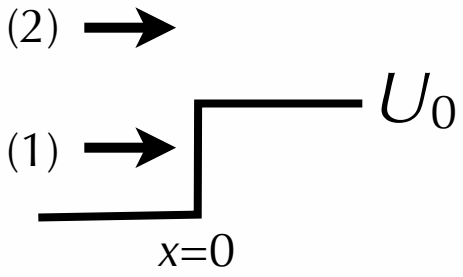
Quiz #7

Consider a step potential as shown.

1. If an incident matter wave with energy $E<U_0$ reaches $x=0$, which of the following is true?

A) R=0 **B) T=0** **C) neither of these**



2. What if the matter wave has energy $E>U_0$?

A) R=0 **B) T=0** **C) neither of these**

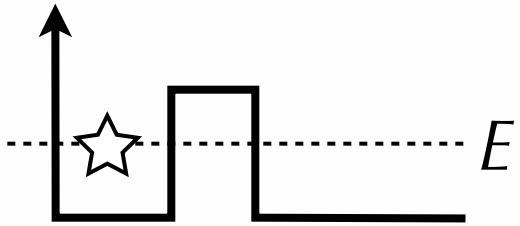
3. A wave is described by the wavefunction shown. What is the reflection coefficient R equal to at $x=0$?

A) $|B/A|^2$ **B)** $|B/A|^2\,(k'/k)^2$
C) $|F/A|^2$ **D)** $|F/A|^2\,(k'/k)^2$

$$\Psi(x,t) = \begin{cases} Ae^{ikx} + Be^{-ikx} & x < 0 \\ Fe^{ik'x} & x > 0 \end{cases}$$

4. A particle is initially placed at the star with the energy marked. This particle is

A) bound **B) unbound**



5. In a dispersive medium, the ___ of light might in fact be larger than c.

A) phase velocity **B) group velocity** **C) neither**

6. In the wavefunction shown, $\Psi(x,t) = Ae^{3i(x-v_A t)}\cos\left(5(x-v_B t)\right)$, which velocity is v_B?

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BCABAB

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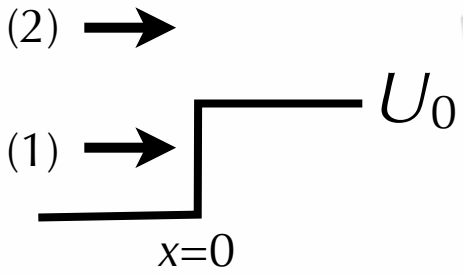

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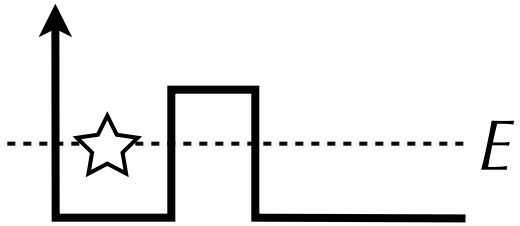

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