4-28

According to Exercise 4-27 because we are trying to find the odd solutions thus:

$$\psi(x) = \begin{cases} 0 & ; \ |x| \geq a \\ A \sin k(x+a) & ; \ -a \leq x \leq a \\ A \sin k(x-a) & ; \ 0 \leq x \leq a \end{cases}$$

On the other hand, by discontinuity of wave function at a and integrating from Schrödinger equation we conclude:

$$Ak \cos ka - Ak \cos ka = \frac{2mV_0}{\hbar^2} A \sin ka$$

So

$$\sin ka = 0$$

Or

$$ka = n\pi \quad ; \quad n = 1,2, \dots$$

And

$$E_n = \frac{n^2 \pi^2 \hbar^2}{2ma^2} \quad , \quad A = \sqrt{\frac{1}{a}}$$

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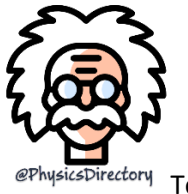
Translate by: 

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