

HW #13 Supplemental

41.1 The longest wavelength corresponds to lowest possible energy - quantum that can be absorbed by the particle in a box.

The formula $E_n = n^2 E_1$ tells us that energy separation is least between first and the next level i.e. $n=1$ & $n=2$.

Hence $hc / \lambda_{\text{given}} = E_2 - E_1$ where $\lambda_{\text{given}} = 600 \text{ nm}$, $E_n = n^2 h^2 / 8mL^2$.

41.4 Just by looking at the wave profile we see that $|\psi(x)|^2$ has 4 anti-nodes thereby implying $n=4$. Then use $E_n = n^2 E_1$.

41.12, 14 There's one more additional fact that may help us in drawing the profile, that of the symmetry of the potential which tells us that wave profile has either to be symmetric or anti-symmetric about the centre.