

24. We can use the mc^2 value for an electron from Table 38-3 ($511 \times 10^3 \text{ eV}$) and the hc value developed in problem 3 of Chapter 39 by writing Eq. 40-20 as

$$E_{n_x, n_y} = \frac{2h^2}{8m} \left(\frac{n_x^2}{L_x^2} + \frac{n_y^2}{L_y^2} \right) = \frac{(hc)^2}{8(mc^2)} \left(\frac{n_x^2}{L_x^2} + \frac{n_y^2}{L_y^2} \right) .$$

For $n_x = n_y = 1$, we obtain

$$E_{1,1} = \frac{(1240 \text{ eV} \cdot \text{nm})^2}{8(511 \times 10^3 \text{ eV})} \left(\frac{1}{(0.800 \text{ nm})^2} + \frac{1}{(1.600 \text{ nm})^2} \right) = 0.73 \text{ eV} .$$