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**Problem 1.7** Calculate the lowest three possible energies of an electron in a hydrogen atom in units of electron volt. Identify all possible electron energies between the lowest energy and  $-2$  eV.

**Solution** The three lowest electron energies in a hydrogen atom can be calculated from:

$$E_n = -\frac{13.6 \text{ eV}}{n^2}, \text{ with } n = 1, 2, \text{ and } 3$$

resulting in:

$$E_1 = -13.6 \text{ eV}, E_2 = -3.4 \text{ eV} \text{ and } E_3 = -1.51 \text{ eV}$$

The second lowest energy,  $E_2$ , is the only one between the lowest energy,  $E_1$ , and  $-2$  eV.

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