

## Exercise 6.1-1

### Shuffling Fermi Functions



"Shuffling" Fermi distributions, while not really difficult, needs some practice and getting used to; it is good exercise to do it a few times (you may also consider to try it for some [shuffling](#) done before).

- Show that the **1st** laser condition

$$E_F^e - E_F^h \geq h\nu \geq E_g$$

- follows directly from

$$\frac{R_{se}}{R_{fa}} = \frac{[f_{e \text{ in c}}(E_1 + h\nu, E_F^e, T)] \cdot [f_{h \text{ in v}}(E_1, E_F^h, T)]}{[1 - f_{h \text{ in v}}(E_1, E_F^h, T)] \cdot [1 - f_{e \text{ in c}}(E_1 + h\nu, E_F^e, T)]}$$



Link to the [solution](#)