Example of entropy quantification

(a) Show that any flow of heat between two "heat reservoirs" (see Wolfram demo of Carnot cycle) must be, according to the 2nd law of thermo, from $T_h$ to $T_l$.

$$\Delta S = \frac{Q}{T} \quad (Q > 0 \text{ when added to a system})$$

$$\Delta S_h = \ldots \quad \Delta S_l = \ldots$$

$$\Rightarrow \Delta S_{\text{tot}} = \Delta S_h + \Delta S_l = \ldots$$

(b) Heat is transferred from a reservoir at 280°C to another at 50°C. If the amount transferred is 600 kJ, determine $\Delta S_{\text{tot}}$.

$$\Delta S_h = \ldots \quad \Delta S_l = \ldots$$

$$\Rightarrow \Delta S_{\text{tot}} = +0.170 \ \frac{\text{kJ}}{\text{k}}$$