Task 5
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Calculate the heat exchange between the two parallel plates:

$\varepsilon_1 = 0.2$
$T_1 = 800$ K
$\dot{Q}_{12}$
$\varepsilon_2 = 0.7$
$T_2 = 500$ K

$$\dot{Q}_{12} = \frac{A\sigma(T_1^4 - T_2^4)}{\frac{1}{\varepsilon_1} + \frac{1}{\varepsilon_2} - 1}$$
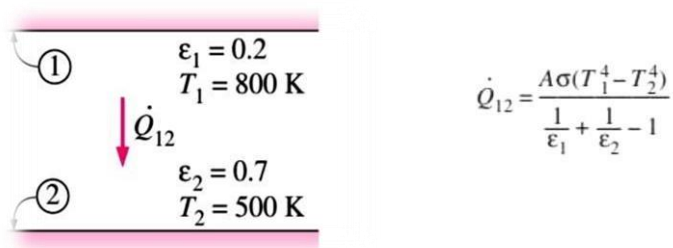
$$Q_{12} = A\frac{5.670 * 10^{-8}*(800^4 - 500^4)}{\frac{1}{0.2} + \frac{1}{0.7} - 1} = A * \frac{19680{,}57}{5.4286} = 3625{,}35 * A \quad [W]$$

If the two emissivities of the plates are 0.1:

$$Q_{12} = A\frac{5.670 * 10^{-8}*(800^4 - 500^4)}{\frac{1}{0.1} + \frac{1}{0.1} - 1} = A * \frac{19680{,}57}{19} = 1035{,}82 * A \quad [W]$$

Conclusion:

With the same area and variation of temperature, increasing the emissivity it also increases the heat exchange between the two parallel plates