Task 1

What is emissivity? It is a measure of how easily a surface or material emits radiation. Emissivity is a surface asset which defines how much radiation an object releases at a given temperature compared to a black body at the same temperature.
Thus,   **0 ≤ε ≤1 where ε is the emissivity coefficient.**
A surface's emissivity is simply the percentage of the emitting substrate. The remaining layer percentage is reflected.

What is absorptivity? It is the quantity of heat penetrating an object or a fabric currently when the temperature is raised. It is the fraction of incident radiation absorbed by the surface. It is calculated by $\alpha = \frac{Absorbed\,rad}{Irradiation} = \frac{G_{abs}}{G}$ **the value varies from 0 to 1.**

What is reflectivity? It is the fraction of incident radiation reflected by the surface. It is calculated by $\rho = \frac{Reflected\,rad}{Irradiation} = \frac{G_{red}}{G}$ **the value varies from 0 to 1.**

What is a view factor? It is the element of energy exiting a surface which is stopped by a second one. It only depends on geometry and not on the surface properties.

The heat exchange between two black surfaces? It is the radiation leaving the entire first surface striking to the second surface minus the radiation leaving the second entire surface that strikes the first surface.

The heat exchange between two grey surfaces? This system will reflect/absorb a given fraction of the thermal radiation a black body would absorb.

What is radiative resistances? It is the capacity of a surface to stand up against radiation heat exchange this property depends on geometry and in general warm resistance of the fabric.

Task 2 Solve the last example you solved in the class (radiative heat exchange between two parallel plates) while considering the two emissivity to be 0.1, what can you conclude from the result?
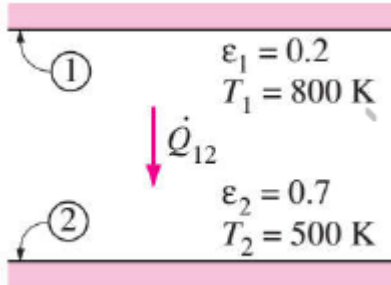
When $\varepsilon_1 = 0.2$; $\varepsilon_2 = 0.7$

$R_{Total} = \dfrac{1}{0.2} + \dfrac{1}{0.7} - 1 = 5.43$

$\dot{Q}_{12} = A\sigma\,(T_1^4 - T_2^4) \,/\, (1/\epsilon_1) + (1/\epsilon_2) - 1 = \dfrac{A*(5.67*10^{-8})*(800^4 - 500^4)}{\frac{1}{0.2}+\frac{1}{0.7}-1} = 3625.4*A$ W

When $\varepsilon_1 = \varepsilon_2 = 0.1$;

$R_{Total} = \dfrac{1}{0.1} + \dfrac{1}{0.1} - 1 = 19$

$\dot{Q}_{12} = \dfrac{A*(5.67*10^{-8})*(800^4 - 500^4)}{\frac{1}{0.1}+\frac{1}{0.1}-1} = 1035.8*A$ W