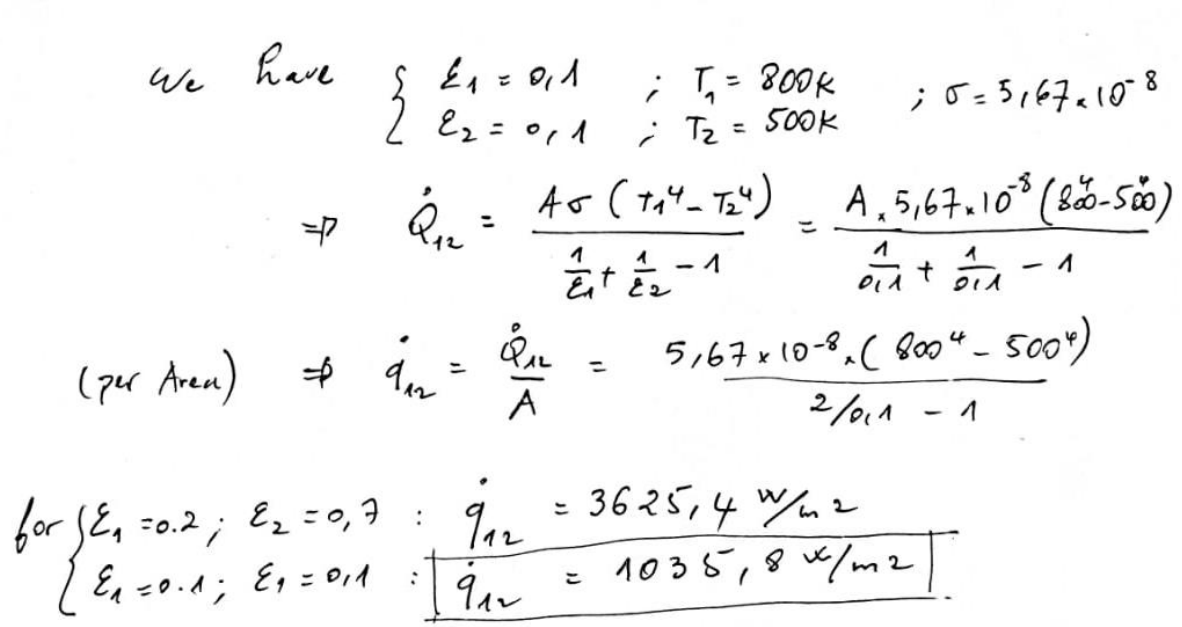
Summary - Definitions

- Emissivity : is how much radiation a surface can emit respected to the black body (it is a ratio considering the emissivity of the black body equal to 1. The emissivity depends on the wavelenght and the direction.
- Absorptivity : is how much a surface can absorb the radiation flux from other surfaces. It is the ratio of the absorbed radiation on the total incident one.
- Reflectivity : is how much a surface can reflect the radiation flux from other surfaces. It is the ratio of the reflected radiation on the total incident one.
- Transmissivity : is how much a surface can transmit the radiation flux coming from other surfaces. It is the ratio of the transmitted radiation on the total incident one.
- Diffuse surface : a surface is considered diffuse when it has the same emissivity in all directions.
- Gray surface : a surface is considered gray when it has the same emissivity for all wavelenghts.
- The view factor : is the ratio of radiation emitted from an element to another.it depends on the area of the body and it should be very low.
- The heat exchange betweeen two black surfaces : its happens when a radiation emitted by a black A surface is absorbed by another surface of another black body B and vice versa. It depends on the emissive power of each one of them, their surfaces and the view factor. We have F(A to B)*A(A)*E(A)= F(B to A)*A(B)*E(B) ; with $E=sigma*T^{2*2}$
- The heat exchange between the two gray surfaces : unlike black surfaces, gray surfaces don't absorb all the emitted radiation (only a portion of reflected radiation + absorbed radiation). Radiation J leaving the surface (A) that strikes the other surface (B) is the substracted radiation leaving the entire surface (B) that strikes surface (A). we have $\dot{Q}_{A\to B} = A_A \times F_{A-B} \times (J_A - J_B)$.
- Radiative resistances is how much a surface can resist emitted radiation by other surfaces. It is used to measure the lost energy due the resistance of the surface. This energy is converted into heat radiation.

Radiative heat exchange between two parallel plates) awhile considering the two emissivities to be 0.1 :



- The heat transfer is significantly affected by the value of emissivity of the surfaces.
- The heat transfer decreases when we decreased emissivity of both surfaces.