Exercice 2:

$(K = \frac{1}{R})$ $\Phi = \frac{S(T_1 - T_2)}{R} \Leftrightarrow T_2 = T_1 - \frac{\Phi R}{S} = T_1 - \frac{\Phi e}{S.\lambda} = 25 - \frac{69 \times 10 \times 10^{-2}}{30 \times 1.75}$

$= 23,7°C$

Exercice 3

1. $R = R_{si} + R_{se} + R_p = \frac{1}{h_{si}} + \frac{1}{h_{se}} + \frac{e}{\lambda}$

$= 0,11 + 0,06 + \frac{20 \times 10^{-2}}{1,2} = 0,3366 \, m^2.K/W$

T_i R_{si} | | R_{se} T_e — 20 cm

2. q (densité de flux) $= \frac{\Phi}{S} = \frac{T_i - T_e}{R} = \frac{20 - 0}{0,3366} = 59,41 \, W/m^2$

le flux $\Phi = \frac{Q}{t}$ ← quantité de chaleur

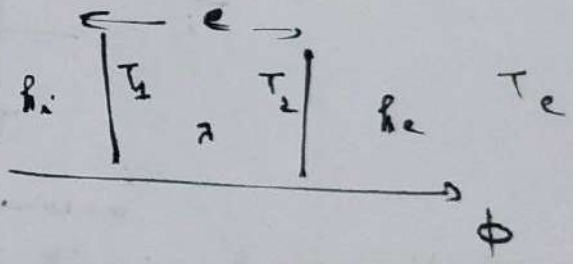
densité de flux $= \frac{\Phi}{S} = \frac{\frac{Q}{t}}{S} = \frac{Q}{St} \Rightarrow Q = q \times S \times t$

$= 59,41 \times 1 \times 3600 \times 24$

$= 5,1 \times 10^6 \, J$

Exercice 4

1) puissance thermique perdue pour simple vitrage:



$\Phi_v = K_v (T_i - T_e) S_v$

$K_v = \frac{1}{\frac{1}{h_i} + \frac{e}{\lambda} + \frac{1}{h_e}} = \frac{1}{r_i + \frac{e}{\lambda} + r_e} = \frac{1}{0.11 + \frac{5 \times 10^{-3}}{1.15} + 0.06} = \frac{1}{0,175} = 5,937$

$\Phi_v = 5,937 \times (19 - (-10)) \times 15 \simeq 2486 \, W$

Pour double vitrage

$\Phi_v = K_v (T_i - T_e) S_v = \frac{1}{\frac{1}{h_i} + 2\frac{e}{\lambda} + \frac{1}{h_e}} (T_i - T_e).S_v$

$\Phi_v = \frac{1}{0,14 + 0,11 + 2 \times \frac{5 \times 10^{-3}}{1,15} + 0,06} (19 - (-10)) \times 15 \simeq 1365 \, W$