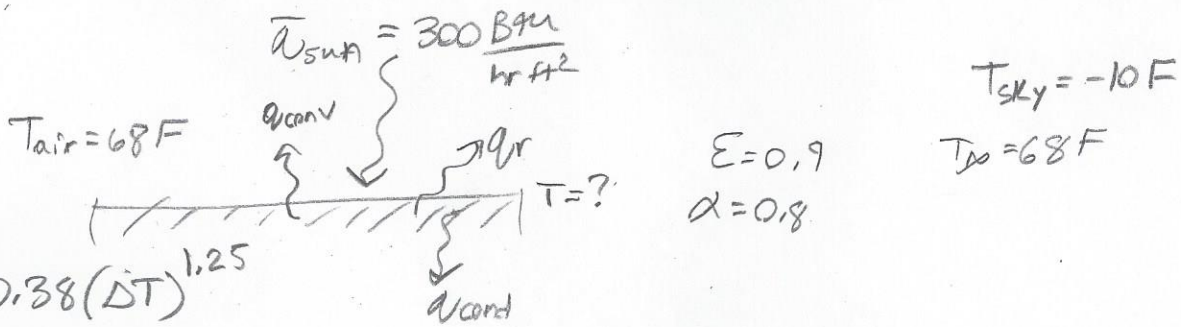


2



a) $q/A = 0.38 (\Delta T)^{1.25}$

$\Delta T = T_{roof} - T_{\infty}$

$q_r = \epsilon \sigma (T^4 - 450^4)$

$\bar{q}_{in} = 300 (0.18)$

$\bar{q}_{out} = \bar{q}_{conv} + \bar{q}_{cond} + \bar{q}_r$

$240 = 0.38 (\Delta T)^{1.25} +$

$240 = 0.38 (T - 528)^{1.25} + 0.9 (0.1714 \times 10^{-8}) (T^4 - 450^4)$

$T = 608 R = \boxed{148 F}$

b) $0.9 (0.1714 \times 10^{-8}) (608^4 - 450^4)$

147.5

$\frac{147.5}{240} = \boxed{0.61}$