Mixed B.C's problem

Q.2 Household electric iron has a steel base ($\rho = 7840 \frac{kg}{m^3}$, $C_p = 450 \frac{J}{kgK}$, $K = 70 \frac{W}{mK}$) which weighs 1 kg. The base has a ironing surface of $A = 0.025 m^2$ and is heated from one side by heater of 250 W, initially iron is at 20°C. Then heating starts and also iron started loosing heat from other side through convection to ambient at $T_\infty = 20°C$ with $h = 50 \frac{W}{m^2 K}$

a) Calculate the temp. of iron after 5 min. of starting heater.

b) What would be the equ. temp. of the iron be if the control does Auto-switch off the power?

$T_i = 20°C$, $T_\infty = 20°C$

$\therefore 1 \times 10^{-2} m$