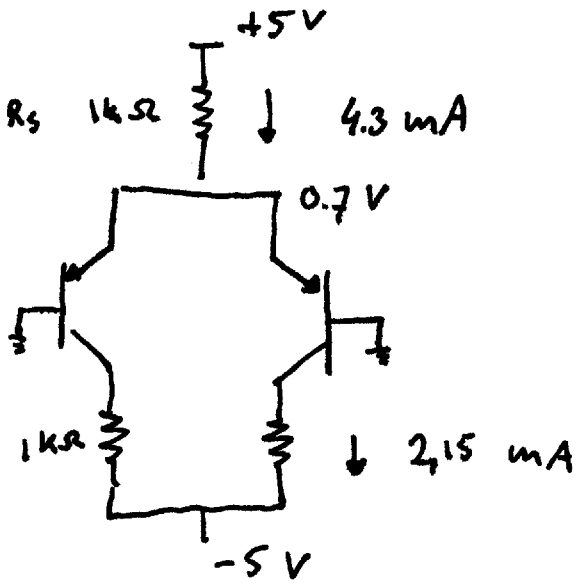
1)



$I_S = (5 - 0.7)/1k\Omega = 4.3\ mA$

$I_C = I_S/2 = 2.15\ mA$

$P_S = 5V \cdot 4.3\ mA + 5V \cdot 4.3\ mA$

$= 43\ mW$

P in R_S = 4.3 V x 4.3 mA (VxI)

= 18.5 mW

P in $R_C = I^2R = (2.15)^2 \times 1k\Omega$

$= 4.6225\ mW$

x2 = 9.25 mW

The rest is in the transistors

$(43 - 18.5 - 9.25)\ mW / 2 = 7.625\ mW$

in each transistor.

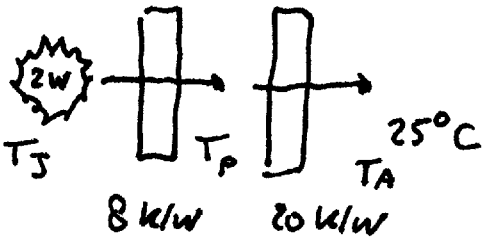
The temperature will be

$T_J = T_{amb} + \Theta_p \times P =$

$40°C + 40°C/W \times 7.625\ mW =$

40.3°C no problem!

2)



$T_J = T_A + (\Theta_{jp} + \Theta_{pa}) \cdot P$

$= 25°C + 28\ K/W \cdot 2W$

$= 81°C$

$T_P = T_J - \Theta_{jp} \cdot P = 81°C - 8\ K/W \cdot 2W = 65°C$

$T_P = T_A + \Theta_{pa} \cdot P = 25°C + 20\ K/W \cdot 2W = 65°C$