Exam 2020

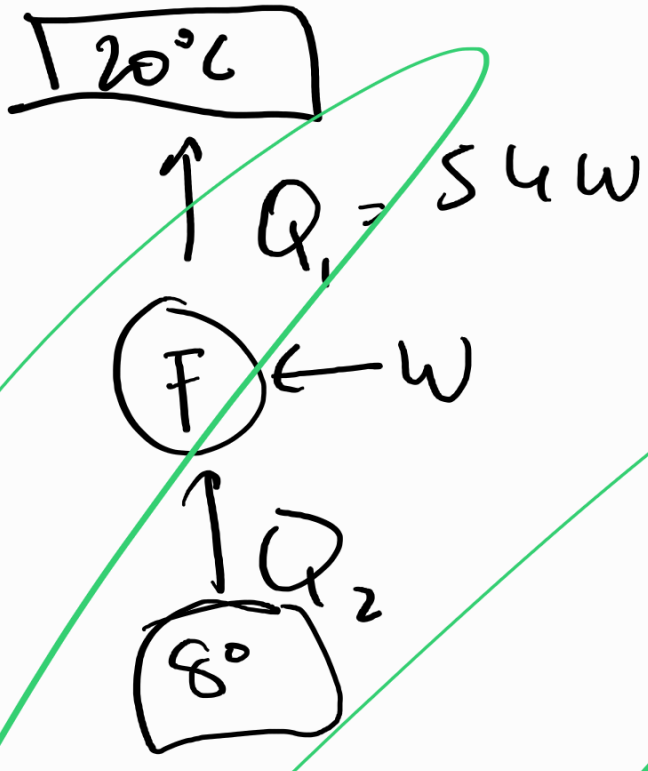
A refrigerator is cooling your food to 8 °C. The temperature of your kitchen is a cosy 20 °C.

(a) What power will have to be supplied to the fridge if the heat output from the back of the fridge is 5 kW? [4]

(b) What is the efficiency of the fridge (for a fridge: $\eta = Q_2/W$)? [1]

$Q_2 = Q_1 - W$

a)



$\frac{Q_1}{Q_2} = \frac{T_1}{T_2}$

$Q_2 = \frac{T_2}{T_1} Q_1$

$= \frac{20}{8} \frac{1}{8}$

$= \frac{1}{2}$

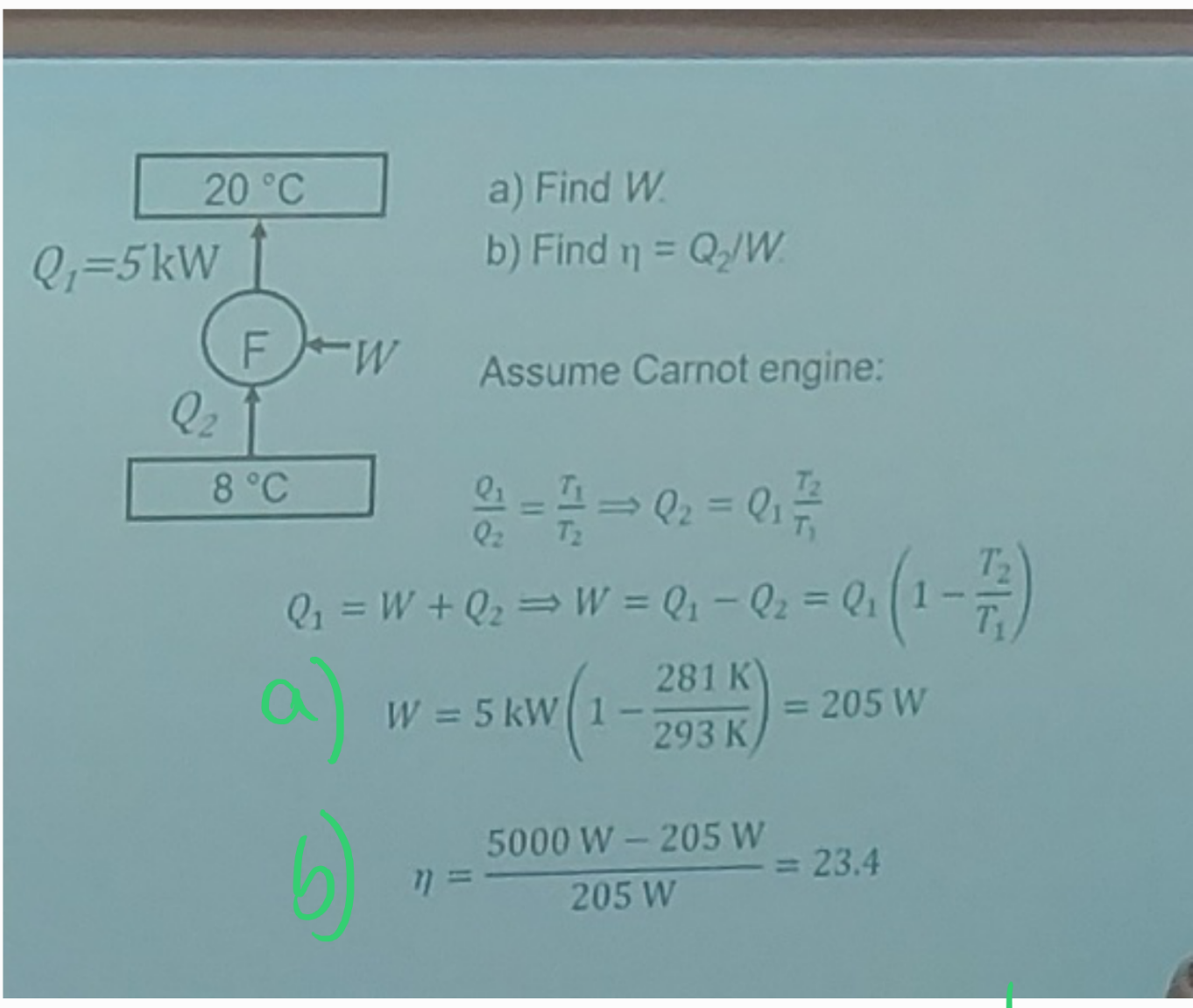
$W = Q_1 - Q_2$

$= 4.5\,kW$

$\eta = \frac{1}{2}$

b) $\eta = \frac{W_{out}}{Q_1} =$

Comets:



heat taking out of ow food