

68. (a) Eq. 21-13 provides

$$K_C = \frac{|Q_L|}{|Q_H| - |Q_L|} \implies |Q_H| = |Q_L| \left(\frac{1 + K_C}{K_C} \right)$$

which yields $|Q_H| = 49 \text{ kJ}$ when $K_C = 5.7$ and $|Q_L| = 42 \text{ kJ}$.

(b) From §21-5 we obtain

$$|W| = |Q_H| - |Q_L| = 49.4 \text{ kJ} - 42.0 \text{ kJ} = 7.4 \text{ kJ}$$

if we take the initial 42 kJ datum to be accurate to three figures. The given temperatures are not used in the calculation; in fact, it is possible that the given room temperature value is not meant to be the high temperature for the (reversed) Carnot cycle – since it does not lead to the given K_C using Eq. 21-14.