

69. (a) Combining Eq. 21-9 with Eq. 21-11, we obtain

$$|W| = |Q_H| \left(1 - \frac{T_L}{T_H} \right) = (500 \text{ J}) \left(1 - \frac{260 \text{ K}}{320 \text{ K}} \right) = 94 \text{ J} .$$

(b) Combining Eq. 21-12 with Eq. 21-14, we find

$$|W| = \frac{|Q_L|}{\left(\frac{T_L}{T_H - T_L} \right)} = \frac{1000 \text{ J}}{\left(\frac{260 \text{ K}}{320 \text{ K} - 260 \text{ K}} \right)} = 231 \text{ J} .$$