

36. Eq. 21-8 still holds (particularly due to its use of absolute values), and energy conservation implies $|W| + Q_L = Q_H$. Therefore, with $T_L = 268.15$ K and $T_H = 290.15$ K, we find

$$|Q_H| = |Q_L| \left(\frac{T_H}{T_L} \right) = (|Q_H| - |W|) \left(\frac{290.15}{268.15} \right)$$

which (with $|W| = 1.0$ J) leads to

$$|Q_H| = |W| \left(\frac{1}{1 - \frac{268.15}{290.15}} \right) = 13 \text{ J} .$$