Answer/Multiple Choice: 1.

2. For a monatomic gas, the only kind of kinetic energy is translational, which is what temperature is related to.
Diatom molecules have rotational and vibrational internal energies, which do not contribute to a temperature increase but which take energy.
3. (b)
4. (c)
5. (a)

Problem 1: (a) \( L = 3.45 \) m
(b) \( L = 2.5 \) m
(c) \( \beta = 92.5 \) dB

Problem 2: (a) \( T = 96.7^\circ C \)
(b) \( m_{\text{ice}} = 80 \) g
(c) 1.72

Problem 3: (a) \( W = 60 \) J and \( Q = 120 \) J
(b) \( W = 30 \) J and \( Q = 90 \) J
(c) \( W = -91 \) J and \( Q = 0 \), but work must be positive since gas expands, so this was a malformed question and wasn’t used in calculation of the grade (even though no one noticed the error).