Thermodynamic Problems

1. Calculate ΔE for each of the following cases.
   a. q = +51 kJ, w = -15 kJ
   b. q = +100 kJ, w = -65 kJ
   c. q = -65 kJ, w = -20 kJ

2. A gas absorbs 45 kJ of heat and does 29 kJ of work. Calculate ΔE.

3. A system releases 125 kJ of heat, and 104 kJ of work is done on it. Calculate ΔE.

4. If it takes 526 kJ of energy to warm 7.40 g of water by 17^oC, how much energy would be needed to warm 7.40 g of water by 55^oC?

5. Convert the following number of calories or kilo calories into joules or kilojoules.
   a. 7845 cal
   b. 4.55×10^4 cal
   c. 62.142 kcal
   d. 43.024 cal

6. Convert the following kilojoules into kilocalories. (Remember: kilo means 1000)
   a. 462.4 kJ
   b. 18.28 kJ
   c. 1.014 kJ
   d. 190.5 kJ

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