Problem 4.

Isobaric means constant pressure. Work done on the gas $R = -\int P\,dV = -P(V_2 - V_1)$. Using the equation of state $PV = NT$ at each endpoint: $R = -N(T_2 - T_1) = N(T_1 - T_2)$.

The first law of Thermo is $\Delta E = Q + R$ with $E = NC_vT$

$$Q = NC_v(T_2 - T_1) + N(T_2 - T_1) = N(C_v + 1)(T_2 - T_1)$$

and since $C_v + 1 = C_p$,

$$\boxed{Q = NC_p(T_2 - T_1)}$$

Comparing this to Problem 3, to achieve the same temperature rise at constant pressure, one needs to supply more heat, the difference is $C_p - C_v = 1$ per particle.