

Stuff for Friday, June 1, 2012

- Quiz today on T7, T8
- Final exam is here next Thursday from 3:30pm-5:18pm.
 - Covers Q12-Q14 and T1-T8
 - Review sheets plus your own annotations
 - Open office hours in M2048 next week; just drop by or email to be sure
- I've enjoyed having all of you in class. I wish you the best in your future studies.

T8, T9 stuff:

- Entropy $S = k_b \ln \Omega$, so $\Omega = e^{S/k_b}$; $\partial S / \partial U \equiv 1/T$ defines temperature
- Characteristic temperature $T_\epsilon \equiv \epsilon/k_B$; dof's switched off if $T_\epsilon \ll T$
- Entropy of a monatomic gas

$$\Omega(U, V, N) \approx \frac{1}{N!} \left(\frac{8mV^{2/3}bU}{3Nh^2} \right)^{3N/2} \quad S(U, V, N) = \frac{3}{2} Nk_B \ln \left(\frac{8mV^{2/3}bU}{3Nh^2} \right) - k_B \ln(N!)$$

- Entropy change: $dS = dQ/T$ with constant N , only work from quasistatic ΔV
constant T : $\Delta S = \frac{Q}{T}$ phase change: $Q = \pm mL$ specific heat: $\Delta S = mc \ln \frac{T_f}{T_i}$
- Efficiency of heat engine and coefficient of performance for refrigerator:

$$e \equiv \frac{|W|}{|Q_H|} \leq \frac{T_H - T_C}{T_H} \quad \text{COP} \equiv \frac{|Q_C|}{|W|} \leq \frac{T_C}{T_H - T_C}$$