Midterm 2 extra practice problems

These problems are meant to provide opportunities for supplemental practice in addition to the homework problems, quiz problems, and examples in Chapters 4–6. Numerical answers are provided to check your solutions.

- Koretsky 4.15(b)
  - Answers:
    - a = 3.13 J m^3/mol^2 (you can use the equations for a and b in the textbook and in your notes, but recall how to derive EOS constants from critical pt data)
    - b = 1.72 x 10^{-4} m^3/mol
    - T = 550.8 K
- Koretsky 5.24
  - Answers:
    - a) $v_\mathrm{m}/c_\mathrm{p,m}$
    - c) $\frac{1}{c_\mathrm{p,m}}\frac{RTv_\mathrm{m}^3(v_\mathrm{m}-b)}{RTv_\mathrm{m}^3-2a(v_\mathrm{m}-b)^2}$
- Koretsky 5.37
  - Answer: 261.6 K
- Koretsky 5.38
  - Answers:
    - a) T_2 = 552 K
    - b) $\Delta s_\mathrm{m,sys}$ = –46.9 J/mol-K, $\Delta s_\mathrm{m,surr}$ = 54.08 J/mol-K, ΔS_univ = 544 J/K
- Koretsky 5.60
  - Answers:
    - w_m = –8487 J/mol
- Koretsky 6.21
  - Answer:
    - T = 935 K
    - Note: this will need to be solved for numerically. On exams, numerical answers can be solved for analytically without a solver/graphical solution. If this problem or a similar one was given, it would specify that finishing with an expression where T is the only unknown would be sufficient.
- Koretsky 6.34a
  - Answers:
    - T_trip = 230 K, P_trip = 0.30 bar
- Koretsky 6.56
  - Answers
    - a) T_out = 325 K
    - b) 9200 J/mol
    - c) 6100 J/mol