Homework 18: Phase Transformations of Pure Substances (cont.)

5.48 (pg. 185)  This problem is “just math” but the results feed into the next problem. And it illustrates part of the process of putting equations in reduced variables, an important skill for physicists (and other crazy people like astronomers, other scientists, ...)

5.51 (pg. 185)  This one is just math too but is important for the same reason. Note that in the final result, the constants $a$ and $b$ have disappeared. So, any problem we solve using the result applies to every van der Waals fluid. (Lazy physicists want to solve a whole class of problems, not just one problem, in one fell swoop.)
5.52 (pg. 185) Turn in your code and plots on separate pages. This problem isn’t difficult but will require some use of the computer (chance to use your 230 skills). Hints: if you use Mathematica or Maple to plot $G(p)/NkT$, you will have to make parametric plot since $G(p)$ is multivalued for some values of pressure (MATLAB doesn’t make that distinction since it plots data rather than functions). You can just “eyeball” the critical pressure from the $p(v)$ plot; no need to do anything fancier.