3.012 PS 1 Grading Guidelines and Common Errors

Overall, people did well. Below is a point-breakdown and description of frequently made mistakes and misperceptions. I have also made a couple of notes about my expectations for psets (please read the bold part, if nothing else).

Problem 9: worth 5 pts.

Part a) 1 pt.
Part b) 4 pt. Up to 2 pts. max if you only considered a one-component system (for which density is intensive), without addressing complications in multi-component systems.

Problem 10: worth 10 pts.

2 pts. per problem: 0.5 pts. for making a reasonable choice; 1.5 pts. for explanation.

Part (c), etc**. Please note: "Explain... [and] defend your choice" should mean a little something more than giving me the definition of an 'X' system.** I took off 0.5 pts. if you didn't make any specific reference to how the definition applies to your system. Mostly I did this on part (c) since that is where most people did not explain anything; though this may seem overly pedantic, I was not as strict as I could have been.

Part (e) I accepted a variety of answers depending on how well-defended they were, but one note to those students who tried to make a case for an adiabatic system: it is unlikely that matter but not heat would travel through your breath – try breathing on your hand! Also, next time please everyone be clear about where you are drawing the boundary.

Problem 11: 20 pts.

Part (a) 8 pts. total: 2 pts. for graphs and explanation, 1 pt. for dw = -PdV, 1 pt. each for work calculation (loss of 0.5 pts for wrong units – only punished once this time), 1 pt. for correct signs (only punished once if carried through to parts c and e), 1 pt. for saying process B work is greater than process A work (loss of 0.5 pts if stated that gas does the work), 1 pt. for explicitly stating that dw = 0 for the isochoric paths in the processes.

Notes: First, please get used to showing your work! Clear explanations are part of what is expected from you; I am not a mind reader, so even if I suspect that you know what you're doing, I want it to be spelled out. (Nor is a there need to be wordy; just say as much as is needed to make your approach clear.) Second, this time around I gave you the isochoric work explanation point if you discussed it in part (e) but didn't mention it in part (a): I won't always find such ways to be nice!

Part (b) 2 pts.
Part (c) 4 pts. U=U(T) and T=T(P, V) so you *can* calculate it.
Part (d) 2 pts.
Part (e) 4 pts.