

Thermodynamics & Statistical Mechanics PSet 4

1. **Book Problems:** 3.5, 3.12, 3.13, 3.25, 3.26, 3.29
2. **Equations of State:** Extra Credit – The equation of state constrains the form of the internal energy. (a) Starting with $dU = TdS - PdV$, show that the equation of state $PV = NkT$ in fact implies that U can only depend on T . (b) What is the most general equation of state consistent with an internal energy that depends only on temperature?
3. **Book Problem Extra Credit:** 2.42, 3.7