

Problem 1

Determine the maximum amount of work that can be obtained from two identical bodies at temperatures T_1, T_2 ($T_1 > T_2$) when their temperatures are made equal. Assume the specific heat C_v is independent of temperature. Write your answer in terms of C_v, T_1, T_2 .

Problem 2

Consider the Van der Waals equation and compute the relation between density and pressure and density and temperature as you go through the critical point. That is, fix T to its critical value and change p or fix p to its critical value and change T .

Define critical exponents for this system and compute them.

Problem 3

Determine at what temperature water boils at a height of 3000m and 6000m.