

2. We have two large solid blocks with heat capacities C_1 and C_2 . Assume these heat capacities are each constant in the range of temperatures considered in this problem. Initially the two blocks are at temperatures T_{1o} and T_{2o} and have entropies S_{1o} and S_{2o} , respectively, with $T_{1o} > T_{2o}$. In this problem there are no volume changes.
- a) Let these two blocks be in an isolated enclosure, so that no heat or work can flow in or out from the rest of the universe. What is the maximum total entropy that this system of two blocks can reach? How do you describe this maximum entropy state? Justify your answer.
- b) Alternatively, run a very small, reversible Carnot heat engine between the two blocks until equilibrium is reached and no more work can be extracted. What is the final temperature? How much work did the engine do?