* Clones Game

Label diagonally weights: 1, ½, ¼, etc.

1. Total weight of clones is preserved
2. Total weight of all squares = 4
3. Total weight of prison = 2
4. Total weight of all cells outside of prison = 2 = Total weight of prison

🡺 Contradiction

* Proofs

Techniques

1. Direct Proof
2. Proof by Contraposition
3. Proof by Contradiction
4. Proof by Cases

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Reduce to the Halting Problem to show Incomputability

1. ???
2. Given specification S and program P, does P satisfy S?
3. Given two programs, P1 and P2, do P1 and P2 have the same behavior on all inputs? (or even on any specific input?)
   1. Can use reduction to show that it’s equivalent to the Halting Problem (by setting P1 to halt, which would be testing the halting status of P2)
4. Wang Tiling Problem
   1. Input ??
   2. ???
5. Matrix Mortality Problem
   1. Input: A finite set of 3x3 integer matrices
   2. Question: Can we multiply the matrices, in any order (repetitions allowed), so that the product is the 0 matrix?
6. Conway’s Game of Life
   1. Input: initial configuration of organisms I; A final …???