

Math 491, Problem Set #10
(first part due 10/16/03; second part due 10/21/03)

1.
 - (a) Use transfer matrices to find the generating function for the number of domino-tilings of the 4 -by- n grid-graph.
 - (b) Use transfer matrices to find the generating function for the number of irreducible domino-tilings of the 4 -by- n grid-graph. (Here an irreducible tiling is one that cannot be decomposed into tilings of two smaller rectangles of height 4 .)
 - (c) Check your work by deriving your answer to (a) from your answer to (b) and vice versa.
2.
 - (a) Find a generating function for the number of spanning trees of a 2 -by- n grid-graph.
 - (b) These numbers turned up in a homework problem you did earlier in the course. Which one was it?
 - (c) Is this a coincidence, or is there a connection between the two problems? That is, can you find a bijection between the two sorts of combinatorial objects?