Math 491, Problem Set #18
(due 12/4/03)

1. Use Lindstrom's lemma, the interpretation of domino tilings as routings, and a computer, in order to count the domino tilings of an 8-by-8 square. (You will receive no credit for merely giving the correct answer.)

2. Using the bijection between tilings and routings discussed in class, Lindstrom's lemma, and Dodgson condensation, prove that for all $a, b \geq 0$ and for $c = 3$, the number of ways to tile an a, b, c, a, b, c semiregular hexagon with unit rhombuses is equal to

$$\frac{H(a+b+c)H(a)H(b)H(c)}{H(a+b)H(a+c)H(b+c)}$$

where $H(0) = H(1) = 1$ and $H(n) = 1!2!3! \cdots (n-1)!$ for $n > 1$.