Solutions will be presented for Problems 1, 4, and 5 from Homework 4, as well as the problems below.

1. A \textit{T-omino} is the tile with four squares pictured below. We say a chessboard is \textit{tiled} with T-ominoes if every square on the chessboard is covered by exactly one square of a T-omino. Prove by induction that for \( n > 1 \), every \( 2^n \) by \( 2^n \) chessboard can be tiled with T-ominoes.

\[
\begin{array}{c}
\text{T-omino}
\end{array}
\]

2. Consider the following recursive definition of the sequence of Fibonacci numbers:

\[
\begin{align*}
f_0 &= 0 \\
f_1 &= 1 \\
f_n &= f_{n-1} + f_{n-2} & \text{for } n \geq 2
\end{align*}
\]

Use strong induction to prove that \( f_n \geq (3/2)^{n-2} \) for \( n \geq 1 \).

3. Suppose that a store offers gift certificates in denominations of 25 dollars and 40 dollars. Using strong induction, show that with only these denominations of gift certificates, it is possible to generate any multiple of five dollars that is greater than or equal to $140.