Math 2326 - Introduction to Abstract Mathematics
Assignment 6 - Due Friday, February 1

In Problems 23 through 25, prove the given statement.

Problem 23:

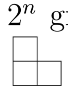
Let $n \in \mathbb{N}$ and $k \in \mathbb{Z}$. If $0 \leq k \leq n-1$ then

$$\binom{n}{k} + \binom{n}{k+1} = \binom{n+1}{k+1}.$$

Problem 24:

For all $m \in \mathbb{N}$ such that $m \geq 8$, there exist $a, b \in \mathbb{N} \cup \{0\}$ so that $3a + 5b = m$.

Problem 25:

Let $n \in \mathbb{N}$. If a single square is removed from a $2^n \times 2^n$ grid then the resulting figure can be covered by non-overlapping tiles of the form .

Problem 26:

Let $n \in \mathbb{N}$. Conjecture and prove a closed form expression for

$$\sum_{i=1}^{n} \frac{1}{i(i+1)}.$$