1. Use strong induction to prove that any postage greater than or equal to 18 cents can be made from 3 and 10 cent stamps. [40 pts]

2. Define the recursive sequence: 

\[ a_1 = 3, \quad a_2 = 6 \text{ and } a_n = 5a_{n-1} - 6a_{n-2} + 2 \text{ for } n \geq 3. \] 

Use strong induction to prove that \( a_n = 1 + 2^{n-1} + 3^{n-1} \) for all \( n \in \mathbb{N} \). [40 pts]

3. Use weak induction to prove that for \( n \geq 2 \) that a \( 2^n \times 2^n \) chessboard with a corner piece missing can be covered completely by pieces shaped like:

```
+---+
 |   |
+---+
```

[20 pts]