Problem 1: Using the Quotient Remainder Theorem find the following:
If \( a \mod 7 = 2 \) and \( b \mod 7 = 4 \), find \((2a+3b) \mod 7\).

Problem 2: According to the Quotient Remainder Theorem how are the integers partitioned by \( \mathbb{Z} \mod 7 \)?

Problem 3: Find the value of \( \sum_{i=1}^{n-2} (-1)^i (2^{-i}) \) when \( n = 3 \).

Problem 4: Given the recursive sequence \( a_1 = 2, a_2 = 4, a_3 = 6, a_n = a_{n-1} + a_{n-2} - a_{n-3}, n > 3 \), find the first six terms in this sequence.

Problem 5: If you are given a sequence function \( f(n) = \pi^{n-1} \), find the recursive sequence that will give you the same results.

Problem 6: Reduce the following factorials.

a) \( \frac{(n-2)!}{(n+2)!} \)

b) \( \frac{(n+2)!}{(n-5)!} \)