Quiz due on Monday:

Use PMI to prove all of the following:

Problem 1: \(1 + 4 + 7 + \ldots + (3n - 2) = \frac{n(3n-1)}{2}, n \in N\)

Problem 2: \(2n + 1 < 2^n, \text{ for } n \in N, n \geq ???\)

Problem 3:

Given the sequence function \(f(n) = 5^{n-1}\), create the recursive sequence that will give you the same sequence values and then prove that your recursive sequence is equivalent to this function sequence for all natural numbers.

Problem 4: If the function is given to be \(f(n) = 2 + n\) and the recursive sequence is given to be \(a_1 = 3, a_2 = 4 \text{ and } a_n = 2a_{n-1} - a_{n-2}\), then prove that they are equivalent.

Quiz from Class: If you did feel you did not do this correctly in class then you can have another go at it. The resulting grade will be averaged with your in class grade.

Use PMI to prove that for the recursive sequence \(a_1 = 1, a_2 = 1, \text{ and } a_n = 2a_{n-1} + 3a_{n-2}\) for \(n > 2\), that \(a_n < 3^n\).