Math 2534  Homework on functions

Problem 1: Theorem: If the A and B are finite sets such that the n(A) = n(B), then any function mapping A to B is one to one if and only if it is onto.

Problem 2: If f:(zmod5) → (zmod 4) when f[x] = [3x + 2], determine if f is a bijection. Justify your conclusion by showing all values in domain and co-domain.

Problem 3: Determine if the following function is a bijection. Show all work and state the appropriate definition. If f(x) is not a bijection, then explain why and make the needed modification to create an inverse function giving the inverse function that will result.

\[ f(x) = \frac{2x + 1}{x - 2} \]

Problem 4: For all sets A, \( A \subseteq f^{-1}(f(A)) \). Explain why this is true.

Problem 5: For set A, B and C, if \( f : A \rightarrow B \) and \( g : B \rightarrow C \), then find a function that maps C to A.

Problem 6: How many people must be in a room to guarantee that at least 5 people have the same birth month?