Submissions: This assignment is due on Th Oct 21st. Each student must submit his or her own assignment. To submit:

1. Solutions can either be typed in Latex, MSWord or other such word processing software, or printed clearly - with each question, the question number should be there, and everything must be in order.

2. You must write your name and email clearly on your submitted assignment.

3. The solution must be submitted in class.

Academic Integrity: Working in groups is ALLOWED. However, everyone must write out their own solutions. Absolutely no word to word copying from any source is allowed. Please refer to the course policies and syllabus about this.

Partial solutions: If you are sure that you know how to arrive at a solution, but you get stuck in some place, it is better to write the partial solution. Honest attempts at partial solutions will be awarded.

Question reasoning: A Yes/No or simple computational problem might be given below. For full points on it however, your computation and reasons for the answer must always be provided.
Problem 1 [20 pts]: Let \( A = \{1, 2, 4, 7\} \). Give an example of a relation on \( A \) that is not symmetric but it is transitive.

Problem 2 [30 pts]: Let \( f : \mathbb{R} \to \mathbb{R} \) be defined as \( f(x) = x^2 - 2x + 1 \). If \( f \) injective? Is \( f \) surjective? Is it bijective? State your reasons for full points.

Problem 3 [20 pts]: Show that the function \( f : \mathbb{R} \setminus \{1\} \to \mathbb{R} \setminus \{2\} \) given by \( f(x) = \frac{2x-7}{x-1} \) is bijective. Find the definition of the inverse function \( f^{-1} \).

Problem 4 [15 + 15 = 30 pts]: Let \( f : A \to B \) and \( g : B \to C \) be functions, where \( A, B, C \) are sets. Show the following:

(I) If the function \( g \circ f \) (composition of \( g \) with \( f \)) is injective, then \( f \) must be injective.

(II) If the function \( g \circ f \) is surjective show that \( g \) is surjective.