HOMEWORK 2

1. Let \( A = \{1, 2, 3\} \) and \( B = \{4, 5, 6\} \) and \( f = \{(1, 5), (2, 6), (3, 5)\} \). If \( f \) a function from \( A \) to \( B \)? If so, is it one-to-one? onto? What is \( f(1) \)?

2. Let \( A = \{1, 2, 3\} \) and \( B = \{4, 5, 6\} \) and \( f = \{(1, 5), (2, 6), (3, 4)\} \). If \( f \) a function from \( A \) to \( B \)? If so, is it one-to-one? onto? What is \( f(1) \)?

3. Let \( A = \{1, 2, 3\} \) and \( B = \{4, 5, 6\} \) and \( f = \{(1, 5), (2, 5), (3, 5)\} \). If \( f \) a function from \( A \) to \( B \)? If so, is it one-to-one? onto? What is \( f(1) \)?

4. Let \( A = \{1, 2, 3\} \) and \( B = \{4, 5, 6\} \) and \( f = \{(1, 5), (2, 6), (2, 5), (3, 4)\} \). If \( f \) a function from \( A \) to \( B \)? If so, is it one-to-one? onto? What is \( f(1) \)?

5. Let \( A = \{1, 2, 3, 4\} \) and \( B = \{a, b, c, d, e\} \). Give an example of a function \( f : A \to B \) which is one-to-one. Give a different example of a function \( g : A \to B \) which is not one-to-one. Is there a function \( h : A \to B \) which is onto?

6. Let \( A = \{1, 2, 3, 4\} \) and \( B = \{a, b, c, d, e\} \). Give a function \( f : B \to A \) which is not one-to-one. Give an example of a function \( g : B \to A \) which is not onto. Is there a function \( h : B \to A \) which is one-to-one?

7. Give an example of a function \( f : \mathbb{N} \to \mathbb{N} \) which is not one-to-one but is onto. Give an example of a \( g : \mathbb{N} \to \mathbb{N} \) which is not onto but is one-to-one. Give an example of a function \( h : \mathbb{N} \to \mathbb{N} \) which is neither one-to-one nor onto.