Problem 1. Exercise 3.1.1(d,e)

Problem 2. There are 6 possible functions from $A = \{1, 2, 3\}$ to $B = \{1, 2\}$ that are onto $B$. List them, answering in terms of ordered pairs.

Problem 3.

(a) Describe a function $f$ from the set of even integers $A = \{\ldots, -4, -2, 0, 2, 4, \ldots\}$ to the set of odd natural numbers $B = \{1, 3, 5, \ldots\}$ that is both one-to-one and onto.

(b) Describe a function $g$ from the set of even integers $A = \{\ldots, -4, -2, 0, 2, 4, \ldots\}$ to the set of odd natural numbers $B = \{1, 3, 5, \ldots\}$ that is both one-to-one and to the the set difference $B \setminus \text{range}(f)$ is an infinite set.

Problem 4. Exercise 3.1.16.

Problem 5. Exercise 3.2.6(d)

Problem 6. Given $f : \{1, 2, 3, 4\} \to \{1, 2, 3, 4\}$ defined as $f = \{(1, 3), (3, 1), (2, 4), (4, 2)\}$, and given $g : \{1, 2, 3, 4\} \to \{1, 2, 3, 4\}$ unknown, but with $g \circ f = \{(1, 3), (3, 1), (2, 2), (4, 4)\}$ find the following (answer in terms of ordered pairs):

(a) $f \circ f$
(b) $g \circ f \circ g \circ f$
(c) $g$