Homework No.1 for Math 3121

Deadline: Sept 18, 11pm. Late submissions will **not** be accepted.

Problem 1. Text book page 46, problems 11. 12. 13. 14. 15. 16. 17. 18. (just answer "yes" or "no", no reasons needed,)

Problem 2. Determine whether the given set S with the given operation is a group (just answer "yes" or "no", no reasons needed.)

(1). S is the set of positive real numbers, the binary operation in the multiplication.

(2). S is the set of complex numbers $x + iy$ with imaginary part $y \geq 0$, the binary operation is the addition.

(3). $S = \{even, odd\}$, the binary operation on S is given as

$$even{+}even = even, \quad even{+}odd = odd, \quad odd{+}even = odd, \quad odd{+}odd = even.$$

(4). $\mathbb{R}$ is the set of real numbers, the binary operation is $*$

$$a * b = a + b - 2.$$

(5). S is the set of all positive real numbers, the binary operation $*$ is the usual division, that is, $a * b = \frac{a}{b}$.