Math 220 (HNR) – Homework 2

Due Thursday 02/02 at the beginning of class

PART A

Problems from the textbook:

- Section 1.1 # 2(c,e,f,h); 3(c,e,f,h) 5(b,c,e,f).
- Section 1.2 # 5(b,c,e); 13c; D4
- Section 1.3 # 1(b,c), 2(a,b,c)

PART B

1. Express the following statements in symbols. (**Do not use** "⇒".)
   (a) Every even integer can be expressed as the sum of two odd integers.
   (b) The square of any real number is positive.
2. Given a quantified statement
$$\forall x \in \mathbb{Z}^+, (\exists y \in \mathbb{Z}^+ \ni xy \in \mathbb{E}). \tag{1}$$
   (a) Express the given statement (1) in words.
   (b) Express the **negation** of the given statement (1) in symbols. **(Do NOT use the symbol "∉".)**
   (c) Express the **negation** of the given statement (1) in words.
3. Negate the following statements:
   (a) There is a politician who is honest or trustworthy.
   (b) The number p is prime or the number q is not prime.
4. Given a quantified statement
$$\forall x \in \mathbb{R},\ \exists n \in \mathbb{Z}\ \ni\ (n \leq x < n+1). \tag{2}$$
   (a) Express the statement (2) in words.
   (b) Express the **negation** of the statement (2) in symbols. **(Do NOT use the symbol "∉" and interval notation.)**
5. Consider the following statement:

   "If x is a real positive number, then there is a real positive number ε such that $x < \varepsilon$ but $\frac{1}{\varepsilon} < x$."

   (a) Express the given statement in symbols. (**Do not use** "⇒")
   (b) Express the **negation** of the given statement in symbols.
   (c) Express the **negation** of the given statement in words.