

# Homework 6

Math 220 (section 906), Fall 2018

This homework is due on Thursday, October 4. (Turn in your answers to questions 1–5.) You may cite results from class, as appropriate.

0. (*This problem is not to be turned in.*) Read Sections 4.1 and 4.2.

(a) Section 4.1 #1, 2

(b) Section 4.2 #1, 2

1. True/False (explain your answers briefly)

(a) For every set  $A$ , the following holds:  $\emptyset \subseteq A$ .

(b) For every set  $A$ , the following holds:  $\emptyset \in A$ .

(c) For every set  $A$ , the following holds:  $\{\emptyset\} \subseteq A$ .

(d)  $[4, 6) \subseteq (4, 5)$

2. Rewrite the following sets as lists:

(a)  $\{n \in \mathbb{Z} \mid 2 < n \leq 5\}$

(b)  $\{n \in \mathbb{R} \mid n^2 = 100\}$

(c)  $\{n \in \mathbb{Z} \mid n^2 \leq 30\}$

(d)  $[3, 10) \cap \mathbb{Z} \cap \{n \in \mathbb{R} \mid n > 5\}$

3. Prove or disprove the following claims:

(a) Let  $A$ ,  $B$ , and  $C$  be sets. If  $A \cap B = A \cap C$ , then  $B = C$ .

(b) Let  $A$ ,  $B$ , and  $C$  be sets. If  $A \setminus B = C \setminus B$ , then  $A = C$ .

4. Section 4.1 #3, 4, 6

5. Section 4.2 #1(f), 4, 8