

## Instructions

The weekly homework is supposed to be worked on paper (I recommend you work by hand on new sheets of paper and scan in the result) and the answer being uploaded. (You do not need to upload the problem sheet, nor copy problem text, but I'm asking that you work the problems on **blank** paper, **not** on the free space of the problem sheet, as doing so leads to overly terse responses.)

You may discuss the problems with other class participants, but the final write-up (not just copying an existing response) should be your own.

Each problem carries the same weight and counts towards the homework points.

You will submit your work in a Canvas-linked tool, called "gradescope". You can upload either a PDF or multiple images. After uploading, you will be asked to mark where each problem is covered in your submission – this is to help me with grading.

Homework is due by 10pm on the indicated day.

1) Let  $A = \{3, 4, 5, 6, 8\}$ ,  $B = \{z \in \mathbb{Z} \mid z \geq 3 \text{ and } z \leq 8\}$ ,  $C = \{3, 4, 5, 6, 7, 8, 7, 6\}$ , and  $D = \{z \in \mathbb{Z} \mid z \in A\}$ . Which of the following statements are true? In each case, give a brief (few words) justification, of why this is the case:

a)  $A \subset B$

b)  $B \subset C$

c)  $B = C$

d)  $A \in B$

e)  $D \subset A$

f)  $A \subset D$

g)  $7 \in A$

h)  $7 \in B$

i)  $7.5 \in B$

j)  $\{3, 4\} \in A$

k)  $\{4, 3\} \subset A$

l)  $\{\{3, 4\}\} \subset A$

2) Let  $A, B$  be sets. Is  $A \cap B \cap A = A \cap B$ ?

Is  $A \cap (B \cup A) = (A \cap B) \cup A$ ?

Explain your answers!

You are explicitly forbidden to share course material with people outside the class, or with any websites that allow posting of such material. This includes "(homework) help" sites or "test/homework data banks".