

Math 108, problem set 02
REVISED TUE JAN 29
Outline due: Mon Feb 04
Completed version due: Wed Feb 06
Last revision due: Mon Mar 17

Exercises (to be done but not turned in): 6.1-6.4, 6.6-6.7, 6.9, 6.11-6.12; 7.3, 7.5.
Problems to be turned in: All numbers refer to problems in the Yellow Book.

1. Let

$$\begin{aligned}A &= \{(x, y) \in \mathbf{R}^2 \mid x = 0\}, \\B &= \{(x, y) \in \mathbf{R}^2 \mid y = 0\}, \\C &= \{(x, y) \in \mathbf{R}^2 \mid xy = 0\}.\end{aligned}$$

Prove that $A \cup B = C$.

2. 6.14(d). (Problem 6.16(b) is no longer assigned.)
3. Consider the sets

$$\begin{aligned}A &= \{(x, y) \in \mathbf{R}^2 \mid x^2 + y^2 \leq 1\}, \\B &= \{(x, y) \in \mathbf{R}^2 \mid |x| \leq 1\}, \\C &= \{(x, y) \in \mathbf{R}^2 \mid |y| \leq 1\}, \\D &= B \cap C.\end{aligned}$$

Does $A = D$? Is one of A and D a subset of the other, or is neither a subset of the other? Carefully state and prove your answer.

4. 7.1(b).
5. 7.1(d).
6. 7.9.
7. 7.11.