Foundations of Mathematics — Math 300 Sections 902, 905

Tuesday 17 November 2020 — Concept Quiz

Answers to Concept Quiz Sections 7.3

Relations. Answer the following true/false questions.

- Is the divisibility relation $|$ on the integers symmetric?

($\times$) No. We not not have that $\forall a, b \in \mathbb{Z}$ if $a|b$, then $b|a$.
For example, while $2|20$ it is not the case that 20 divides 2.

- Is the divisibility relation $|$ on the integers transitive?

($\checkmark$) Yes. We proved this earlier in the semester.
For all $a, b, c \in \mathbb{Z}$, if we have that $a|b$ and $b|c$, then $a|c$.

Partitions. Answer the following true/false questions.

- Let $\mathcal{P} := \{[i, i+1] \subseteq \mathbb{R} \mid i \in \mathbb{Z}\}$.
Is $\mathcal{P}$ a partition of $\mathbb{R}$?

($\times$) No. The sets are not disjoint,
every integer belongs to two closed intrervals in the set $\mathcal{P}$.

- Let $\mathcal{P} := \{(i, i+1) \subseteq \mathbb{R} \mid i \in \mathbb{Z}\}$.
Is $\mathcal{P}$ a partition of $\mathbb{R}$?

($\times$) No. While the sets are disjoint,
they do not cover $\mathbb{R}$, as no integer lies in any interval in the set $\mathcal{P}$.