

Errata

Section 1

The Axiom of Extension

Suggestion 1.1. p. 2: Emphasize how axiom of extension is not a definition of equality. (Equality follows another property, namely axiom of substitution). Look at these: [link](#), [link](#).

Section 2

The Axiom of Specification

Math error 2.1. p. 4: “except only the axiom of extension” should also include the axiom of foundation (although not discussed in the book).

Math error 2.2. p. 6: It should be noted that the “axiom of specification” is not an “axiom”, rather an “axiom schema”.

Section 5

Complements and Powers

Suggestion 5.1. p. 19: It should be noted that axiom of powers and axiom of unions imply axiom of pairs.

Math error 5.2. p. 20: The De Morgan's laws as stated make sense only for nonempty \mathcal{C} 's if the old definition of intersections.

Math error 5.3. p. 20: In the exercise, the existence of the sets $\bigcap_{X \in \mathcal{C}} \mathcal{P}(X)$ and $\bigcup_{X \in \mathcal{C}} \mathcal{P}(X)$ requires replacement which hasn't occurred up till now. Also, \mathcal{C} must be nonempty.

Section 7

Relations

Math error 7.1. p. 28: In "if $R = X \times X$, then the set X itself is the only equivalence class", X must be nonempty.

Section 8

Functions

Math error 8.1. p. 30: “if $(x, y) \in f$ and $(x, z) \in f$, then $y = z$ ” is *stronger* than “for each x in X there is a unique element y in Y with $(x, y) \in f$ ”, which just ensures uniqueness when both $y, z \in Y$.

Section 9

Families

Math error 9.1. p. 35: In the lines just before the exercise, the set X is not necessary, whereas the family A must be mentioned to be nonempty.

Suggestion 9.2. p. 36: In the last paragraph, poor notation. X is the family as well as the Cartesian product of the family.

Math error 9.3. p. 36: Onto-ness for arbitrary I and J can't be shown without axiom of choice.

Section 14

Order

Math error 14.1. p. 54: In the exercise, it should be “*inclusions*” involving R , and not “*equations*”.

Section 15

The Axiom of Choice

Math error 15.1. p. 60: In second paragraph, it should be “every *nonempty* relation includes a function with the same domain”.

Section 16

Zorn's Lemma

Suggestion 16.1. p. 62: It should be commented that the hypothesis of the Zorn's lemma (as stated), automatically imply that X is nonempty.

Section 17

Well Ordering

Math error 17.1. p. 68: The third sentence is false. See [this](#).

Math error 17.2. p. 68: Just before the exercise, it should be the first element of the *nonempty set being considered* not U .

Suggestion 17.3. p. 69: The first two lines are redundant, for the hypotheses of the Zorn's lemma already imply that $\mathcal{W} \neq \emptyset$. (See Suggestion [16.1](#).)

Section 18

Transfinite Recursion

Math error 18.1. p. 71: In the proof, we need to prove “that for each e in W there exists a *unique* element x in X such that...”, not “at most one”.

Math error 18.2. p. 71: In the second paragraph, the parenthetical “(by the uniqueness assertion of the theorem)” is wrongly stated. The correct reason is the induction hypothesis.