

# Errata

## *Mathematics: A Discrete Introduction*

This is a list of errors found in *Mathematics: A Discrete Introduction* by Edward R. Scheinerman (Brooks/Cole 2000). If you find errors, please report them to me at [ers@jhu.edu](mailto:ers@jhu.edu). Thank you.

- Page 2, last line of paragraph 4. “See Section C” should read “See Appendix C.” [Doug Shier]
- Page 4, line 8. “... ought to chose ...” should read “... ought to choose ...” [Kent Donnelly]
- Page 5, exercise 4. A clarification: The point of this problem is to define a relation on *integers*. This point is not clear as one might suppose the problem is about natural numbers. The idea is to use natural numbers to define the relations  $<$ ,  $\leq$ , etc.  
A correct answer to this problem would begin as follows: “Let  $a$  and  $b$  be integers. We say that  $a$  is *less than*  $b$ , and we write  $a < b$  provided ...” [Peter Landweber]
- Page 6, line 8. “... but you may chose to ...” should read “but you may choose to.” [Doug Shier]
- Page 15, exercise 7. A clarification: A side of a spherical triangle is an arc of a great circle. [Peter Landweber]
- Page 14, marginal note that refers to problem 2. The word “*inverse*” should be “*converse*”. [George Mackiw]
- Page 17, line 6, parenthetical remark: The word *then* should be enclosed in quotation marks. [Peter Landweber]
- Page 28, Proof Template 4. The placement of this proof template is confusing as it separates the sentence “The following result summarizes...” from Theorem 5.2. [Doug Shier]
- Page 31, problem 5.14. The second word of the problem is “expressions” but it should be “expression.” [Donniell Fishkind]
- Page 33, line –5. Change “must be” to “are”. [Peter Landweber]
- Page 37, display in middle of page. Delete the comma after “and so forth” to be consistent with display at the top of the page. [Doug Shier]
- Page 50, line 7. “length-three” should be “length three.” [Doug Shier]
- Page 53, line –2. Change “type” to “types”. [Peter Landweber]
- Page 57, problem 9.5(g). The  $\exists x$  should be  $\exists y$ . [Rachel Scheinerman]
- Page 88, first line after Example 13.2. The set  $\{1, 2, 3, 4, 5\}$  should be  $\{1, 2, 3, 4, 5, 6\}$ . [Levi Ortiz]

- Page 91, middle. The text reads "...of the equivalence class [RADaKRAV]." The two Rs should be different sizes: "...of the class [RADaKRAV]." [Rachel Scheinerman]
- Page 96, text following Example 14.6, continuing to page 97. This discussion involves the notion of set complement which is only discussed in Exercise 10.17 (pp. 69-70). A cross reference to that exercise should be included here. [Doug Shier]
- Page 97, 4 lines after Proposition 14.7. Change "a lucky set of  $k$  children" to "a set of  $k$  lucky children". [Peter Landweber]
- Page 113, Theorem 15.8. When we take  $n = k = 0$ , the RHS produces  $\binom{-1}{0}$  which is nonsense. [Evan O'Dea]  
*Author comment:* Exercise 15.10 covers the case  $\binom{-1}{0}$  which does (correctly) evaluate to 0. However, the Exercise appears after the Theorem.
- Page 115, exercise 15.9. The formula is incorrect; delete the first term on the right hand side. That is, the upper indices on the multinomial coefficients should start with 1, not 0. [Ben Babcock]
- Page 119, paragraph following equation (5). "... that does not contain..." should be "... that do not contain..." There are three instances of this error. [Doug Shier]
- Page 121, end of sentence after the long display. "...from Exercise 16.3" should read "...from Example 16.3." [Doug Shier]
- Page 124, lower ghastly formula. The big union should start at  $k = 1$  (not  $k = 0$ ) and the exponent on  $(-1)$  should be  $k + 1$ . [Peter Landweber]
- Page 141, last line. "counterexample" should read "counterexamples". [Donniell Fishkind]
- Page 143, after Equation (13). "... by adding 2 to both..." should read "... by adding  $2 - x^2$  to both..." [Peter Landweber]
- Page 176, exercise 1, line 4. Text reads  $1 < 5 < 2 < 3 < 4$  but it should read  $1 < 5 > 2 < 3 < 4$ . [Rachel Scheinerman]
- Page 203, Example 25.3. The text reads  $f(n) = O(n^2)$  but it should read  $f(n)$  is  $O(n^2)$ . This misuse of the equal sign is not explained until the bottom of page 204. [Russ Rutledge]
- Page 228, problem 1(d). The second  $A$  should be a  $B$ . [Rachel Scheinerman]
- Page 229, problem 9. The probability of  $B$  should not be 1, otherwise, the probability of  $\bar{B}$  would be 0 rendering  $P(A|\bar{B})$  undefined. So the first sentence should end "... and suppose  $0 < P(B) < 1$ ." [ERS]
- Page 235, problem 1(e). The variables  $s$  and  $t$  should be  $m$  and  $n$ , respectively. Likewise, in part (g) the variable  $s$  should be  $n$ . [Rachel Scheinerman]
- Page 243, second line in proof of Theorem 30.10. On the right side of the equation we have  $E(aY)$  but it should be  $E(bY)$ . [Ryan Swanson]

- Page 260, problem 9(a). The  $-4$  in the displayed equation should be a  $-6$ , i.e., it should read  $(2x - 6)|(x^3 - 3x^2 + 3x - 9)$ . [Rachel Scheinerman]
- Page 283, line  $-3$ .  $\mathbb{Z}_{10}$  should be  $\mathbb{Z}_{11}$ . [Rachel Scheinerman]
- Page 289, proof of Theorem 35.1, end of second paragraph. We use the fact that if  $x$  is a positive integer,  $x \neq 1$ , and  $x$  is not prime, then  $x$  is composite. The proof of this fact is absent from the text. [Peter Landweber]  
*Author's note:* The proof is a suitable homework problem that I ought to include in a future edition.
- Page 295, problem 35.12. There is an unfortunate line break between  $2^{a-1}$  and  $(2^a - 1)$  in the last sentence of this problem. The last sentence reads: "Prove that if  $2^a - 1$  is prime, then  $n = 2^{a-1}(2^a - 1)$  is perfect." [ERS]
- Page 332, statement of Theorem 39.7. The theorem concludes "then  $a$  is not prime" but it should read "then  $n$  is not prime." [Rick Jarvis]
- Page 338, second paragraph of the section "Square Roots Modulo  $n$ ": The text reads "When we ask for the square roots of 59, we...", but it should read "When we ask for the square roots of 17, we...". [Donneill Fishkind]
- Page 404, next-to-last line. The parentheses surrounding "Exercise 49.4" should be removed. [Donniell Fishkind]
- Page 431, last line to top of 432. "Consider elements  $c$  and  $d \dots$ " This is a bad example. It should be elements  $b$  and  $c$ . [Sandi Klavzar]
- Page 447, hint for problem 1.2. The text reads "there are integers  $a$  and  $b$  with  $a|b$  but  $\frac{a}{b}$  is not an integer." This should be "there are integers  $a$  and  $b$  with  $b|a$  but  $\frac{a}{b}$  is not an integer." [Richard Belshoff]
- Page 449, answers for 6.9 (a), (c), and (e). These are all incorrect. The exponent '7' should be '9' in all three cases. [Gary Morris]
- Page 457, answer to 28.2. The compound fraction  $(1/6)/(1/9)$  at the end of the answer should read  $(1/9)/(1/6)$ . The same error is also in the *Instructor's Guide* on page 98. [Ryan Mansfield]

#### Typos in the *Instructor's Guide*

- *Instructor's Guide*. Page 5, second paragraph. "for the definition" should read "form the definition." [Peter Landweber]
- *Instructor's Guide*. Page 19, answers to 6.9 are incorrect. [Seema Aggarwal]
- *Instructor's Guide*. Page 24, answer to 9.5(g): the second quantifier should use the dummy variable  $y$  instead of  $x$ . [Rachel Scheinerman]

- Instructor’s Guide. Page 35, line 2 of section 12: “venture in” should read “venture into.” [Peter Landweber]
- Instructor’s Guide. Page 41-42, answer to 14.6(b) is incorrect. [ERS]
- Instructor’s Guide. Page 50, answer to 15.9. Overall, the answer is somewhat incorrect since the problem is wrong (see earlier errat for Problem 15.9). Furthermore, in the last section of “complicated answer” the Guide has  $\binom{k-1}{j}$  but it should read  $\binom{j}{k-1}$ .
- Instructor’s Guide. Page 93, first paragraph, line 7: “increases retention” should be “increase retention”. [Peter Landweber]
- Instructor’s Guide. Page 106, line 3: “We answer” should be “Our answer”. [Peter Landweber]
- Instructor’s Guide. Page 119, answer to 33.14(a) is incorrect. The statement is false, but the counterexample given is bad. [George Huang]
- Instructor’s Guide. Page 121, last line of introduction: “an” should be “in”. [Peter Landweber]
- Instructor’s Guide. Page 165, first line of Section 49: delete “a” at end of line. [Peter Landweber]
- Instructor’s Guide. Page 170, line 1: “students attention” should be “students’ attention”. [Peter Landweber]
- Instructor’s Guide. Page 176, answer to 53.2(a) is incorrect. The number of linear extensions is one more than reported. The missing linear extension is  $3 < 4 < 1 < 2$ . [Karen Seyffarth]

Updated: February 27, 2005.