## Errata <br> Mathematics: A Discrete Introduction, third edition

This is a list of errors found in Mathematics: A Discrete Introduction, 3rd edition, by Edward Scheinerman. If you find errors, please report them to me at ers@jhu.edu. Thank you.

- Inside front cover: "Proof of Templates" should be "Proof Templates".
- Page 11, 4 lines from the bottom: "condition $A$ hold" should be "condition $A$ holds". [Andrew Wardly]
- Page 13, third line of Lemma: "proving a such theorems" should be "proving such theorems". [Jeff Fink]
- Page 14, Exercise 4.12(b). The question asks for a conjecture abou the sum of consecutive cubes, but the explanatory sentence "clarifies" by asking: what can you say about $1^{3}, 1^{3}+3^{3}, 1^{3}+3^{3}+5^{3}, 1^{3}+3^{3}+5^{3}+7^{3}$ and so on. That's an error that seems to be asking for a conjecture about the sum of consecutive odd cubes (not what was intended). The explanatory sentence should say, what can you say about $1^{3}, 1^{3}+2^{3}, 1^{3}+2^{3}+3^{3}, 1^{3}+2^{3}+3^{3}+4^{3}$, and so on. [Ethan Duckworth, Timothy Brauch]
- Page 15, Exercise 4.12(c). The parenthetical condition, that no two of the lines are parallel, should also include the condition that no three of the lines are concurrent (go through the same point). [Jennifer Beineke]
- Page 23, Exercise 5.14. "Let $x$ be an integers" should read "Let $x$ be an integer". [Alexander Johnson]
- Page 38, Exercise 8.5, second paragraph: "player I if allow" should read "player if I allow". [Hannah Shawabkeh]
- Page 50, Exercise 10.2(d). The number 49 is missing from the set. [Jennifer Beineke]
- Page 106. In several locations the term $x^{k}$ or $x^{n}$ is missing from the infinite sums. [Alyson Hildum]
- Page 132, just before equation (14). "To prove Equation (18)" should read "To prove Equation (13)". [Alexander Johnson]
- Page 140, penultimate line of the proof of Proposition 22.6: $10 \cdot 10^{k+1}=10^{k+1}$ should read $10 \cdot 10^{k+1}=10^{k+2}$. [Omar Mallick]
- Page 156, one third down the page. We have $c(4)=4$ but it should say $c(4)=3$. [Matthew Song]
- Page 157, end of the proof of Theorem 23.9. The very last equation reads $c_{2}=$ $\left(a_{0} r-a_{1}\right) / r$ but it should be $c_{2}=\left(a_{1}-a_{0} r\right) / r$. [Alex Dunlap]
- Page 194, proof of Lemma 27.13. We have written $\iota$ as a composition of $a$ transpositions, but later in the proof (page 195, second paragraph) we define $\tau_{k}=(a, b)$. Replace the displayed equation by $\iota=\tau_{t} \circ \tau_{t-1} \circ \cdots \circ \tau_{1}$ so we don't use $a$ in two different ways.
- Page 195, proof of Lemma 27.13, first bullet, second sentence reads:

Before applying $\tau_{k}$, we had $a$ and $x$ inverted, but $x$ and $b$ were in their natural order. After applying $\tau_{k}$, we have $x$ and $b$ inverted, but $x$ and $a$ are in their natural order.
However, it should read:
Before applying $\tau_{k}$, we had $b$ and $x$ inverted, but $x$ and $a$ were in their natural order. After applying $\tau_{k}$, we have $x$ and $a$ inverted, but $x$ and $b$ are in their natural order.
[Jonathan Schweiss]

- Page 233, line 7: $B(N, p)$ should be $B(n, p)$. [Nicholas Knight]
- Page 243, line 2: Extraneous :bc below the summation symbol. [Nicholas Knight]
- Page 255, Corollary 35.4. Note that Corollary 21.2 already shows that every integer is either even or odd. [Alex Dunlap]
- Page 260, proof of Proposition 36.4, fourth paragraph: " $c=\operatorname{gcd}(a, b)$ " should be " $c=a \bmod b$ ". [Alex Dunlap]
- Page 302, second line (part of Exercise 41.4): $h=g_{1} \oplus g_{2}$ should read $h=h_{1} \oplus h_{2}$. [Thomas Belej]
- Page 323, line - 2 : $\mathbb{Z}_{p q}^{*}$ should be $\mathbb{Z}_{p q}$. [Nicholas Knight]
- Page 352, third line after Definition 50.6: "is a trees" should be "is a tree". [Nicholas Knight]
- Page 354, proof of Theorem 50.11. The arrows marking the parts of the proof are facing the wrong directions. The first one should be $(\Rightarrow)$ and the second should be $(\Leftarrow)$. [Steven Chestnut]
- Page 363, proof of Proposition 52.9, end of fourth line: "Since $T$ is a ..." should read "Since $T^{\prime}$ is a ...". [Furkan Alaca]
- Page 435, solution to Chapter 1 Self Test problem 14. The next-to-last sentence should read: "Since $a+1$ is an integer, $3 \mid(3 a+3)$." [Nicholas Greeby]
- Page 437, solution to Chapter 3 Self Test problem 10. The correct answer is $2 \cdot 10$ ! • $2^{10} / 20$ (which is twice as large as the answer given in the book). The reasoning is as follows. In the numerator, we only counted line-ups of the form AaBbCc. . . J j but neglected to count line-ups of the form aBbCc. . JjA. [Jonathan Schweiss]
- Page 436, solution to Chapter 2 Self Test problem 13(g). The correct answer is "True". [Jennifer Beineke]
- Page 443, right column, solution to problem 3. Arithmetic in part (b) erroneously comes to $\frac{10}{55}=\frac{2}{11}$ but the correct result should be $\frac{15}{55}=\frac{3}{11}$. The incorrect value is used in part (c) which ends with $\frac{1}{11} / \frac{2}{11}=\frac{1}{2}$ but should read $\frac{1}{11} / \frac{3}{11}=\frac{1}{3}$. [Akshay Prabhushankar]
- Page 444, solution to problem 6(b): Some of the numbers in the second and third columns of the chart are incorrect. In particular, we have to be careful to note that if the second card has the same face value (two aces, two 8's, two queens, etc.) as the first card, then there will be only three possibilities for the second card after the first is drawn, since they are drawn without replacement. For example, in the fifth row, if the first card is an 8 then the second card must be an 8 or higher, so there are $3+4 \times 6=27$ choices for the second card, not $4 \times 7=28$ as written. Naturally, this
means the third column has to be corrected as well. The final answer is $95 / 221$ or about 43\%. [Jonathan Schweiss]
- Page 450, solution to problem 4(a). Note that Definition 47.1 (page 333) says that the vertex set of a graph is nonempty. Hence the answer to 4(a) should not include the empty graph and therefore is off by one. One way to fix this problem is report the correct answer as $2^{10}-1$. Perhaps a better way is to allow the empty graph. [Nicholas Knight]
- Page 463, left column, bullet for Transitive property. The second sentence reads: "Likewise for $\leq, \ldots$ " but it should be "Likewise for $<, \ldots$. [Akeem Woods] Errors in the Instructor's Manual
- Page 163, solution to 34.17. Third line has $Y(s) \geq X(s)$ but should be $Y(s) \leq$ $X(s)$. Continuing on the next page, the inequality $\leq$ in the last line of the displayed equation should be reversed to $\geq$. [Nicholas Knight]
- Page 228, solution to 48.4. Since our definition of graph rules out the empty graph, the answer $2^{n}$ should be $2^{n}-1$. [Nicholas Knight]

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