

ERRATA for Ramsey Theory on the Integers

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FRONT MATTER

p. xi, Table 4.1: change “ w ” to “ w' ”

CHAPTER 1

- p. 12, line -11: change “We” to “The”
- p. 12, line -4: insert “monochromatic” before “integers”
- p. 15, line -5: change “ F ” to “ \mathcal{F} ”
- p. 16, line 2: change “exists” to “exist”
- p. 17, line 17: change “ $M(k; 1)$ ” to “ $M(k + 1; 1)$ ”
- p. 20, line -3: change “contain” to “contains”

CHAPTER 2

- p. 24, line -2: change “exist” to “exists”
- p. 29, line -15: change “ $w(3, 4)$ ” to “ $w(3; 4)$ ”
- p. 34, Table 2.1: change “ $w(4, 4, 3; 3) = 84$ ” to “ $w(4, 4, 3; 3) = 89$ ”
- p. 34, Table 2.1: change “ $w(5, 3, 3; 3) = 77$ ” to “ $w(5, 3, 3; 3) = 80$ ”
- p. 37, line 3: change “ $k \geq 1$ ” to “ $k \geq 2$ ”
- p. 38, Table 2.2.: change “ $w(4; 3) \geq 292$ ” to “ $w(4; 3) \geq 293$ ”; change “ $w(5; 3) \geq 1210$ ” to “ $w(5; 3) \geq 966$ ”
- p. 42, line 2: change “ $\nu_n(k)$ ” to “ $\nu_k(n)$ ”
- p. 42, line -2: change “ $\frac{m}{r}$ ” to “ $\frac{m-1}{r}$ ”
- p. 47, line -14: change “ χ_m ” to “ χ ”
- p. 48, lines 5–8: replace the definitions of the x'_i 's by: $x'_0 = d; x'_i = x_{i-1}$ for $1 \leq i \leq t + 1$.
- p. 49, exercise 1: Should read: “Show that within $[1, n]$ there are $\frac{n^2}{2(k-1)}(1 + o(1))$ k -term arithmetic progressions.”
- p. 50, exercise 6: change “ $w(k, 2; r)$ ” to “ $w(k, 2; 2)$ ”
- p. 50, exercise 8: in (b) change “ $\sum_{i=1}^{\frac{n^2}{4} + O(n)} 2^{1-k} = \frac{n^2 + O(n)}{2^{k+1}}$ ” to “ $\sum_{i=1}^{\frac{n^2}{2(k-1)}(1+o(1))} 2^{1-k} = \frac{n^2}{(k-1)2^k}(1 + o(1))$.”
- p. 50, exercise 8: in (c) change “ $\frac{n^2 + O(n)}{2^{k+1}} < 1$ ” to “ $\frac{n^2}{(k-1)2^k}(1 + o(1)) < 1$ ”
- p. 50, exercise 8: in (d) change “ $n = 2^{k/2}$ ” to “ $n = \sqrt{k-1} \cdot 2^{\frac{k-1}{2}}$ ”
- p. 52, line -3: change “ $w(5; 2)$ ” to “ $w(5, 5; 2)$ ”

CHAPTER 3

- p. 61, line -8: change the first occurrence of “ t ” to “ i ”
- p. 69, Table 3.2: replace the functions in the first column by the functions $x - 1, x - 2, x - 3, x - 4$ and $x - 5$ (in that order)
- p. 71, line 2: change “ $x_0 = 0$ and $x_1 = 1$ ” to “ $x_0 = n + 1$ and $x_1 = n$ ”
- p. 71, line 4: change “min” to “max” and change “ $y - x_i$ ” to “ $x_i - y$ ”
- p. 71, line 5: change “ x_1, x_2, \dots, x_k ” to “ x_k, x_{k-1}, \dots, x_1 ”
- p. 71, line 6: change “and that $x_k \leq n$ ” to “that is contained in $[1, n]$ ” (Note: the proof of Theorem 3.21 given in the text is for *ascending* waves.)

- p. 84, line 8: change “ $(1 - a)d$ ” to “ $(1 - a) + d$ ”
- p. 88, line 10: change “ $AP \cup P_{k-2}$ ” to “ $R(AP \cup P_{k-2}, k)$ ”

CHAPTER 4

- p. 105, line -12: change “ k ” to “ $n + 1$ ”
- p. 108, line 16: delete R
- p. 109, line 9: change “ j ” to “ ℓ ”
- p. 111, Theorem 4.9: change “ $m\mathbb{Z}^+$ ” to “ $A_{m\mathbb{Z}^+}$ ”
- p. 111, Corollary 4.10: change “ $\mathbb{Z}^+ - F$ ” to “ $A_{\mathbb{Z}^+ - F}$ ”
- p. 113, line 18: change “the” to “an”

CHAPTER 5

- p. 136, line 5: change “ k ” to “3”
- p. 137, line 9: change “ w ” to “ w' ”
- p. 138, proof: there are 3 occurrences of w that should be w'
- p. 151, line 3: change “ \leq ” to “ $<$ ”

CHAPTER 6

- p. 177, line 1: change “If” to “if”

CHAPTER 7

- p. 190, line -5: change “ \geq ” to “ $=$ ”
- p. 192, line -7 and -9: delete “ $= S_1$ ” and “ $= S_2$ ”
- p. 196, 7.4: delete the comma after S

CHAPTER 8

- p. 205, line -5: change “ $O(n^2)$ ” to “of order n^2 ”; after “i.e.,” add “there exist positive constants b and c such that for n sufficiently large”
- p. 205, line -6: change this line to read $bn^2 \leq \min_x(M_x(n)) \leq cn^2$
- p. 206, line 1: change “ $\frac{n^2}{48} + O(n)$ ” to “ $\frac{n^2}{48}(1 + o(1))$ ”
- p. 206, line 10: change “ $\frac{n^2}{48} + O(n)$ ” to “ $\frac{n^2}{48}(1 + o(1))$ ”
- p. 208, line -4: change “ $+ O(n)$ ” to “ $(1 + o(1))$ ”
- p. 210, line -9: change “the same color” to “of different colors”
- p. 210, line -1: change “ $+ O(n)$ ” to “ $(1 + o(1))$ ”
- p. 211, line 2: change “ $+ O(n)$ ” to “ $(1 + o(1))$ ”
- p. 211, line 4: change both occurrences of “ $+ O(n)$ ” to “ $(1 + o(1))$ ”
- p. 216, lines -15 and -12: change $kn + k - 1$ to $kn + k - 2$
- p. 220, exercise 8.4: change “ $O(n^2)$ ” to “ $cn^2(1 + o(1))$ for some $c > 0$ ”
- p. 220, exercise 8.6: insert “the proof of” before “Corollary”
- p. 221, exercise 8.9: change “Schur triple” to “solution to $\mathcal{L}(k)$ ”

CHAPTER 9

- p. 236, line 10: delete one “is”
- p. 242, line 5: insert “ $1 + i_1a + j_1b = 1 + i_2a + j_2b$ ” after “such that”
- p. 251, line 17: change “ $\{0, 1, \dots, r\}$ ” to “ $\{1, 2, \dots, r\}$ ”
- p. 252, line 6: change “There” to “For every r -coloring of \mathbb{Z}^+ , there”
- p. 256, line -5: insert) after $(2ak + 1)$

p. 258, line -8: the last sentence of §9.2's references should be the first sentence of §9.3's references

CHAPTER 10

p. 261, last line: change “if $t \in T$, then $2t \notin T$ ” to “ $t \in T$ does not imply that $2t \in T$ ”

p. 262, line 2: insert “obtained only” after “sum”

p. 263, lines 3, 5, and 8: change “ $n(k; r)$ ” to “ $kn(k; r)$ ”

p. 263, line 8: change “ $\lceil \frac{m}{2}, m \rceil$ ” to “ $(\frac{m}{2}, m]$,”

p. 263, lines 17 and 19: change “ $(a + d) + D$ ” to “ $(a + d) + \sum_{r \in R \subseteq [1, k]} x_r$ ”

p. 268, Lemma 10.20: before “then” insert “and if either $D + E = \{d + e : d \in D, e \in E\} \subseteq D$ or $D + E \subseteq E$,”

p. 270, replace the first paragraph of the proof of Theorem 10.24 with the following:

We first show that $doa(D) \geq 3$. Assume, for a contradiction, that $\gamma : \mathbb{Z}^+ \rightarrow \{0, 1, 2\}$ is a 3-coloring without arbitrarily long monochromatic D -diffsequences. Let $s_1 < s_2 < \dots < s_m$ be a monochromatic D -diffsequence of maximal length. We may assume this diffsequence has color 2. Then $S = \{s_m + j : j \text{ odd}\}$ is void of color 2. Let $S = \bigcup_{i \geq 0} S_i$, where $S_i = \{s_m + 2i(m + 1) + j : j \in \{1, 3, 5, \dots, 2m + 1\}\}$ are sets of $m + 1$ elements. Define, for $i \geq 0$, $T_i = \{s_m + 2i(m + 1) + j : j \in \{2, 4, 6, \dots, 2m + 2\}\}$, which are also sets of $m + 1$ elements. Each T_i must contain an element of either color 0 or color 1, for otherwise T_i would be an $(m + 1)$ -term D -diffsequence of color 2, contradicting the choice of m . Furthermore, each S_i must contain elements of both color 0 and color 1 (since it is void of color 2), for otherwise S_i would be an $(m + 1)$ -term monochromatic D -diffsequence. Since some color, say color 0, must occur an infinite number of times in the T_i 's, there exist $x_{i_1} \in T_{i_1}, x_{i_2} \in T_{i_2}, x_{i_3} \in T_{i_3}, \dots$, where $i_{j+1} > i_j + 1$, all of color 0. For each $j \geq 1$, let $y_{i_j} \in S_{i_{j+1}}$ be of color 0. Then $x_{i_1}, y_{i_1}, x_{i_2}, y_{i_2}, \dots$ is an infinitely long D -diffsequence of color 0, contradicting the existence of m .

p. 275, line 15: insert “long” after “arbitrarily”

p. 282, line 10: change “ $(i, i + 1, i + 2, \dots, i + j)$ ” to “ $(i, i + 1, i + 2, \dots, i + j - 1)$ ”

p. 282, line -8: change “ $j = y - x - 1$ ” to “ $j = y - x$ ”

p. 285, line 7: change “ $2(m - 1)p - 1$ ” to “ $(2m - 1)p - 1$ ”

p. 288, exercise 9: change each occurrence of “ F_0 ” to “ F_1 ” and each occurrence of “ F_1 ” to “ F_2 ”

p. 288, exercise 10: change “ S_3 ” to “ V_3 ” and “ S_4 ” to “ V_4 ”

p. 290, exercises 10 and 11: change “ f ” to “ Δ ” in each problem

NOTATION

p. 293, $AP_{(m)}$: change “Set” to ”Family”

p. 294, $T_{a,b}$: change “Set” to ”Family”

BIBLIOGRAPHY

p. 301, [66]: insert a comma after “Landman”

p. 302, [91]: change “Isreal” to “Israel”

p. 303, [107]: insert a comma after “Exoo”

p. 310, [232]: change the year to 1968

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p. 317, Mixed van der Waerden: delete 19, and change 52 to 51.