

## Integer flows and cycle covers of graphs

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### ERRATA

updated on 2/8/2007

**On page 40, Proof of Lemma 2.8.4** Interchange the second and the third paragraphs: prove “3-edge-connectivity” first before dealing with digons (by avoiding bridge created after edge-deletion).

**On page 40, Lemmas 2.8.6 and 2.8.7,** Add “( $k \geq 3$ )” after “positive integer.”

**On page 43, line -2,** “ $x_{2i-1}$ ” should be “ $x_{2i+1}$ ”.

**On page 43, line -1,** “ $x_{2i-1}$ ” should be “ $x_{2i}$ ”.

**On page 47, Exercise 2.18,** “(Part of Lemma 2.8.8)” should be “(Do not use Lemma 2.8.8 in the proof)”

**On page 69, line 14** “3.7.3” should be “3.7.4”

**On page 75, line 22** “3.7.4” should be “3.7.5”

**On page 110, line 6** Replace “ $G'$  is a minor of  $G$ ” with “ $G'$  is a planar graph with  $|V(G')| + |E(G')| \leq |V(G)| + |E(G)|$ ”.

#### Correction in the proof of 6-flow theorem:

**on page 116, line 10.** Insert “Choose paths  $P_1$  and  $P_2$  with  $|E(P_1) \cup E(P_2)|$  as small as possible.” after the period (before “Then”).

**on page 116, line 11.** Insert “(by Exercise 5.16),” before “and”.

**ADD Exercise 5.16** as follows:

Let  $x$  and  $y$  be two vertices of a 2-edge-connected graph  $G$ . If  $H$  is a connected cycle of  $G$  containing both  $x$  and  $y$ , then  $H$  must contain a necklace joining  $x$  and  $y$ .

**Proof of Exercise 5.16.** Induction of  $|E(H)|$ . It is obviously true if  $|E(H)| \leq 2$ . Assume that it is true for  $|E(H)| < N$  for some  $N$ . Prove the claim for  $|E(H)| = N$ . If the graph  $H$  contains a cut-vertex  $v$  separating  $H$  into two parts  $H_1$  and  $H_2$ . By inductive hypothesis, each  $H_i$  contains a necklace  $J_i$  joining  $v$  and one of  $\{x, y\}$ . The union of  $J_1$  and  $J_2$  is a necklace joining  $x$  and  $y$ . So the subgraph  $H$  contains a pair of internally disjoint paths  $P_1$  and  $P_2$ . The union of these two path forms a necklace joining  $x$  and  $y$ . **END of proof.**

**On page 220, line 13,** “ $K_{4t+2} \in \mathcal{R}_t \setminus \mathcal{R}_{t+1}$ ” should be “ $K_{4t+2} \in \mathcal{R}_t \setminus \mathcal{R}_{t+1}$ ”.

**On page 221, line 8 (in Definition 9.3.4),** Correction: “... in an orientable surface  $S$ .”

**On page 225, line 8,** “The function  $f = g + f'$  satisfies the assertion of (3).” should be “The function  $f = g + f''$  satisfies the assertion of (3).”

**P 290. Definition A.3.1** replace “ $X \subset V(G)$ ” with “ $X \subseteq V(G)$ ”, delete “and  $0 < |X| < |V(G)|$ ”.

**On page 291, at the end of Corollary A.3.3,** Add: “if  $G - T$  consists of two components of odd orders” after “ $|P \cap T| = 1$ ” Note that the corollary (without the change mentioned above) is true if  $r$  is odd. When  $r$  is even, this extra condition is necessary. This change will not affect its application in the proof of Theorem A.3.2 on page 292.

**On page 298, Theorem A.5.4, Line 2** “ $G$  be  $k$ -edge-connected graph and... ..”

**On page 306, Hint for Exercise 2.18,** Replace the hint with the following sentence. “Use Theorem 2.4.2, and Exercise 2.21”

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