

NOTE

## A NOTE ON TOTAL GRAPHS

S.F. FOROUHANDEH<sup>1</sup>, N. JAFARI RAD<sup>1</sup>

B.H. VAQARI MOTLAGH<sup>1</sup>, H.P. PATIL<sup>2</sup>

AND

R. PANDIYA RAJ<sup>2</sup>

<sup>1</sup> *Department of Mathematics*  
*Shahrood University of Technology*  
*Shahrood, Iran*

<sup>2</sup> *Department of Mathematics*  
*Pondicherry Central University*  
*Puducherry - India*

**e-mail:** n.jafarirad@gmail.com  
hpppondy@gmail.com

### Abstract

Erratum: Identification and corrections of the existing mistakes in the paper *On the total graph of Mycielski graphs, central graphs and their covering numbers*, Discuss. Math. Graph Theory **33** (2013) 361–371.

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### 1. RESULTS

In this paper, we correct the Theorems 1, 4, 8 and 11, and their corollaries of [1]. There was omitted  $t(G)$ , i.e., the number of triangles in  $G$  or  $L(G)$  in Theorem 1 of [1]. The total graph  $T(G)$  contains triangles in  $G$ ,  $L(G)$  and in the incidence graph. All triangles are numbered in the published paper [1] beside triangles in  $G$  or  $L(G)$ . First, we give corrected version of Theorem 1 of [1] as follows by adding the number of omitted triangles  $t(G)$ , and its proof is in similar lines as before.

**Theorem 1.** For any  $(p, q)$  graph  $G$ ,

$$t[T(G)] = 2t(G) + \frac{1}{2} \sum_{i=1}^p \left[ d_G^2(v_i) + 2m_i \binom{d_G(v_i)}{3} \right],$$

where  $m_i = 1$  if  $d_G(v_i) \geq 3$ ; otherwise  $m_i = 0$ .

Due to the change in the statement of Theorem 1 of [1], the remaining Theorems 4, 8, 11 and their corollaries of [1] are corrected as follows.

**Corollary 2.** (a)  $t[T(C_3)] = 8$  and  $t[T(C_n)] = 2n$  if  $n > 3$ .

(b) For  $n \geq 1$ ,  $t[T(K_n)] = \frac{1}{6} [(n^2 - n)(n^2 - 1)]$ .

**Corollary 3.** For  $1 \leq i \leq n$  and  $n \geq 2$ ,  $t[T(\square_{i=1}^n C_{m_i})] = \frac{2Mn}{3}(2n^2 + 1)$  where  $M = m_1 m_2 \cdots m_n$ ,  $m_i > 3$ .

**Theorem 4.** Let  $G$  be any  $(p, q)$ -graph having  $t(G)$  triangles and  $\delta(G) \geq 2$ . Then

$$t[T(\mu(G))] = 8t(G) + \frac{1}{2} \sum_{i=1}^p [3d_G^3(v_i) + d_g^2(v_i)] + \left( \frac{18q + 5p + p^3}{6} \right).$$

**Corollary 5.** For  $n > 3$ ,  $t(T[\mu(C_n)]) = \left( \frac{n^3 + 107n}{6} \right)$ .

**Corollary 6.** For  $n \geq 3$ ,  $t(T[\mu(K_n)]) = \frac{1}{6}(9n^4 - 15n^3 + 6n^2 + 6n)$ .

**Theorem 7.** For any  $(p, q)$ -graph  $G$ ,

$$t[M(G)] = t(G) + \frac{1}{2} \sum_{i=1}^p \left[ d_G^2(v_i) + 2m_i \binom{d_G(v_i)}{3} \right] - q,$$

where  $m_i = 1$  if  $d_G(v_i) \geq 3$ ; otherwise  $m_i = 0$ .

**Corollary 8.** For any  $(p, q)$ -graph  $G$ ,

$$t[M(\mu(G))] = 4t(G) + \frac{1}{2} \sum_{i=1}^p [3d_G^3(v_i) + d_G^2(v_i)] + \frac{p(p^2 - 1)}{6}.$$

**Theorem 9.** For any  $(p, q)$ -graph  $G$  with  $p \geq 4$ ,

$$t[T(C(G))] = 2m + \frac{1}{6}(p^4 - 3p^3 + 5p^2 - 3p + 12q),$$

where  $m = t(C(G))$ .

**Corollary 10.** For  $m, n \geq 3$ ,

$$t[T(C(K_{m,n}))] = t[T(K_{m+n})] - mn(m + n - 4).$$

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### REFERENCES

- [1] H.P. Patil and R. Pandiya Raj, *On the total graph of Mycielski graphs, central graphs and their covering numbers*, Discuss. Math. Graph Theory **33** (2013) 361–71.  
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