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## Note

# A NOTE ON TOTAL GRAPHS 

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#### 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.

586 S.F. Forouhandeh, N. Jafari Rad, B.H. Vaqari Motlagh and et al.

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

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

where $m_{i}=1$ if $d_{G}\left(v_{i}\right) \geq 3$; 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) $t\left[T\left(C_{3}\right)\right]=8$ and $t\left[T\left(C_{n}\right)\right]=2 n$ if $n>3$.
(b) For $n \geq 1, t\left[T\left(K_{n}\right)\right]=\frac{1}{6}\left[\left(n^{2}-n\right)\left(n^{2}-1\right)\right]$.

Corollary 3. For $1 \leq i \leq n$ and $n \geq 2, t\left[T\left(\square_{i=1}^{n} C_{m_{i}}\right)\right]=\frac{2 M n}{3}\left(2 n^{2}+1\right)$ 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

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

Corollary 5. For $n>3, t\left(T\left[\mu\left(C_{n}\right)\right]\right)=\left(\frac{n^{3}+107 n}{6}\right)$.
Corollary 6. For $n \geq 3, t\left(T\left[\mu\left(K_{n}\right)\right]\right)=\frac{1}{6}\left(9 n^{4}-15 n^{3}+6 n^{2}+6 n\right)$.
Theorem 7. For any $(p, q)$-graph $G$,

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

where $m_{i}=1$ if $d_{G}\left(v_{i}\right) \geq 3$; otherwise $m_{i}=0$.
Corollary 8. For any $(p, q)$-graph $G$,

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

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

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

where $m=t(C(G))$.
Corollary 10. For $m, n \geq 3$,

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

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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. doi:10.7151/dmgt. 1670

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