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A NOTE ON THE STRUCTURE OF IDEALS IN A EUCLIDEAN SEMIRING

By Louis Dale

In the paper "The Structure of Ideals in a Euclidean Semiring," appearing in this Journal Volume 17, Number 1, June 1977, pp. 21—29, there is an error in the statement of theorem 11. This theorem stated as follows:

Let A be an ideal in E and $a \in A$. If d divides a and $a+d \in A$, then $dT_a \subset A$. The ideal dT_a in the theorem should be dT_{a^2}. The correct statement of the theorem (with proof) is as follows.

THEOREM. *Let A be an ideal in E and $a \in A$. If d divides a and $a+d \in A$, then $dT_{a^2} \subset A$.*

PROOF. Let $a=dm$ and $x \in dS[a^2, a(a+e)]$. Then $dS[a^2, a(a+e)]=dS[d^2m^2, d^2m^2+dm]$ and it follows that $x=d^3m^2+z$ where $\phi(z) \leq \phi(d^2m)$ and d divides z. Hence $z=kd$ for some $k \in E$. Now $d^2m=pz+r$ where $\phi(r)<\phi(z)$ or $r=0$ and since E is a principal semiring, we have both $d=f+e$ and $p=q+e$ for some $f, q \in E$. All of this gives

$$\begin{aligned} x &= d^3m^2+z=dm(pz+r)+z=a(pz+r)+z=(apz+z)+ar \\ &= k(apd+d)+ar=k[a(f+e)(q+e)+d]+ar \\ &= k[a(fq+f+q)+(a+d)]+ar. \end{aligned}$$

Since $a \in A$ and $a+d \in A$, it follows that $x \in A$. Consequently, $dS[a^2, a(a+e)] \subset A$ and it follows from lemma 10 that $dT_{a^2} \subset A$.

It should be noted that theorem 11 is a generalization of lemma 6 which states: Let A be an ideal in a Euclidean semiring E. If there exists $a \in A$ such that $a+e \in A$, then $T_{a^2} \subset A$.

It should also be noted that on page 28 line four (4) from the bottom the set $V=\{p \mid dT_p \subset A\}$ should be $V=\{p \mid kT_p \subset A\}$ where $k \in W$ such that $\phi(k)$ is minimum.

University of Alabama in Birmingham
Birmingham, Alabama 35294

REFERENCES

[1] Dale, L. and Hanson, D., *The structure of ideals in a Euclidean semiring*, Kyungpook Math. Journal 17(1977), 21—29.