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CORRECTION TO "A CONSTRUCTION OF SIMPLE PRINCIPAL RIGHT IDEAL DOMAINS"

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The proof of Lemma 2 is invalid, since δ is not defined on $K^{[\alpha]}$. When α is surjective, the proof is correct (and the remark preceding Lemma 2 is not needed). The lemma is applied in the proof of Theorem 4 to show that if d, f are monic right invariant of degrees r, n respectively, then $f^r = d^n a$ for some $a \in K^{[\alpha]}$, and this is used to show that $f = d^\nu$. Here is a direct proof.

The hypothesis of Theorem 4 may be simplified by assuming that no power of α is inner. Let us call $f \in R$ *right K-invariant* if for each $c \in K$ there exists c' such that $cf = fc'$; it is clear by comparing highest terms that $c' = c^{\alpha^n} \in K$, where $n = \deg f$.

Let f be monic right K-invariant of degree n, and choose d to be monic right K-invariant of least positive degree r. We have $f = dq + s$, where $\deg s < \deg d$. Now for any $c \in K$,

$$c(dq + s) = (dq + s)c^{\alpha^n} = dc^{\alpha^r}q + cs,$$

hence

$$d(qc^{\alpha^n} - c^{\alpha^r}q) = cs - sc^{\alpha^n}.$$

The right-hand side has lower degree than d, hence both sides are 0 and $cs = sc^{\alpha^n}$. By the minimality of $\deg d$ we have $s \in K$, but no power of α is inner, so $s = 0$ and $f = dq$. Now q is again right K-invariant, and an induction on $\deg f$ shows that $f = d^\nu$. In particular, this applies for every monic right invariant element f, and Theorem 4 follows.

In Theorem 5 the hypothesis on α may also be replaced by the simpler hypothesis that no power of α is inner.

REFERENCES

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