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# Linear Vector Spaces with Indefinite Metric.

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## ERRATUM

In the paper with the above title there is a mathematical error on page 171 In the case a real eigenvalue $p$ of a self adjoint operator $P$ occurs as a non-simple root of the minimum polynomial $m(\lambda)$ of $P$,

$$m(\lambda) = (\lambda - p)^k \cdot q(\lambda), \qquad q(p) \neq 0 , \qquad k > 1 ,$$

we say that *every* eigenvector $\chi$ of $P$, corresponding to this eigenvalue $p$, must have the representation

$$\chi = (P - PI)^{k-1}\varphi ,$$

where $\varphi$ is a suitable non-zero vector. This statement is wrong. The error lies in concluding that

$$(P - pI)\chi \neq (P - pI)^k\varphi , \qquad \text{(for any } \varphi),$$

if

$$\chi \neq (P - pI)^{k-1}\varphi , \qquad \text{(for any } \varphi) .$$

This is wrong since $(P - pI)$ is a *singular* operator.

Thus the correct statement is that, in the case considered, *at least one* (and not every) eigenvector $\chi$ has the representation

$$\chi = (P - pI)^{k-1}\varphi ,$$

with a suitable $\varphi$, and hence

$$\|\chi\| = 0 .$$

Other eigenvectors may or may not have norm zero.

In the special case of two dimensions our conclusion and its applications (Sect. **2**, § 1, 3) later remain unchanged, since in this case when a self-adjoint operator is non-diagonalizable, it has only one eigenvector and so it must be the one with norm zero.

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I wish to thank Mr. N. MUKUNDA for having kindly drawn my attentation to this error.



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