1077-51-65 **Adaeze Christiana Anyaegbunam*** (`adaezeanyaegbunam@rocketmail.com`), Department of Mathematics and Statistics, University of Port Harcourt, Port harcourt, Nigeria. *Complete geometry on a Riemannian $\mathcal{A}$-module. Sylvester's theorem.*

Abstract

As part of more results from my recent PhD thesis titled: **Geometric algebra via sheaf theory: A view towards symplectic geometry**, which serves as a corner stone for Abstract Geomertic Algebra and this paper, and building on prior joint works done by Mallios and Ntumba, we study Sylvester's Theorem via sheaf theory. Given a *Riemannian* $\mathcal{A}$-*module* $\mathcal{E}$ equipped with an $\mathcal{A}$-metric ϕ that is a *symmetric and orthogonally convenient pairing* over an ordered algebraized space $(X, \mathcal{A})$. Then ϕ is $\mathcal{A}$-isometric to $r[1] \perp s[-1]$. Thus, the number r is invariant and it does not, in general, describe the geometry of $\mathcal{E}$ completely. It does so, however, in one important case, which is when every element of $\mathcal{A}$ is a square of an element of $\mathcal{A}$. This holds, for instance, if $\mathcal{A} := \mathcal{P} \cup -\mathcal{P}$, the *ordered* PID $\mathbf{R}$-*algebraized space.* There is an analog of this result in the setting of vector spaces. (Received July 15, 2011)