

Interrogation 22

Dimension

Nom/Prénom :

Note :

1. (a) Énoncer le théorème de la base incomplète.

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- (b) Caractériser par le rang le fait qu'une famille soit génératrice/libre/base.

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- (c) Définir la convergence d'une suite complexe (définition IV.1).

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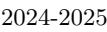
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4. Soit $U = \begin{pmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ -1 & 0 & 0 \end{pmatrix}$. Calculer le rang de $\mathcal{F} = (I_3, U, U^2, U^3, U^4, U^5)$.

5. A l'aide de la dimension, montrer que les espaces vectoriels $F = \left\{ (x, y, z) \in \mathbb{R}^3 \mid \begin{array}{l} x - 2y + 3z = 0 \\ x - y + z = 0 \end{array} \right\}$ et $G = \left\{ (x, y, z) \in \mathbb{R}^3 \mid x + 2y + z = 0 \right\}$ sont supplémentaires dans $\mathbb{R}^3$.

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