Question #22434 Let U and V be vector spaces over a field F and $\dim U = n$. Let $T\colon U \to V$ be a linear operator, then $\operatorname{rank}(T) + \dim\ker(T) = ...$

(A) 0

(B) 1

(C) $n - 1$

(D) n

Please explain

Solution. By definition! nulity of T is $\dim\ker T$. Every book on linear algebra contains the following fact: if $T\colon U \to V$ os linear transformation between finite dimensional llinear spaces, then $\operatorname{rank}(T) + \dim\ker(T) = \dim U$. Hence:

Answer D.