Answer on Question #40118, Math, Linear Algebra

What is the dimension of R^n over R. write it in vectors?

Answer

Definition: If a vector space V has a basis consisting of n vectors, then we say that dimension of V is n. We also write $\dim(V) = n$.

$$\dim(\mathbb{R}^n) = n.$$

This is because the standard basis
$\overrightarrow{e_1} = (1,0,0,\dots,0), \overrightarrow{e_2} = (0,1,0,\dots,0), \dots, \overrightarrow{e_n} = (0,0,0,\dots,1)$

consist of n elements.
Also

$$\dim(\mathbb{R}^n) = tr(id_{\mathbb{R}^n}) = tr\begin{pmatrix} 1 & \cdots & 0 \\ \vdots & 1 & \vdots \\ 0 & \cdots & 1 \end{pmatrix} = n.$$