8/3/17
Barnett.

Math 22 : Correct language worksheet

Prelude: many of you are writing the math equivalent of "me fastly run".
Yet, math must be precise to be rigorous! This will help you (in life too).

A) Complete this table:

math symbol	acts on a ...	... to give a ...
Col	matrix	subspace of $\mathbb{R}^m$, ie a set of vectors in $\mathbb{R}^m$
rank		
dim		
Span		
Nul		
$[\cdot]_B$		

B) Circle only the meaningful terms:

Here A is a matrix, V is a vector space, $\vec{x}$ is in $\mathbb{R}^n$, $\vec{v}_j$ in V, $T: V \to V$ a transformation

A is consistent $A\vec{x}=\vec{b}$ is consistent

Span A Span$\{\vec{v}_1\}$ $\{$Span $[\vec{v}_1, \vec{v}_2]\}$ Span$\{V\}$

dim A det A Nul A dim Col A rank V

dim V Span$\{A\}$ dim Span$\{\vec{v}_1, \vec{v}_2\}$ Nul T $A\vec{x}$

A is linearly independent A spans $\mathbb{R}^m$ the columns of A span $\mathbb{R}^m$ $\{\vec{x}=\vec{0}\}$

Col $A = \mathbb{R}^m$ Col Span A rank T $\{\vec{v}_1, \cdots \vec{v}_n\}$ is lin. indep.

rank Row A A is onto each vector in $\vec{v}_1, \cdots \vec{v}_n$ is lin. indep. $\{A\vec{x}\}$

V is a basis A is a basis $\{\vec{v}_1 \cdots \vec{v}_n\}$ is a basis for V $\vec{x}\vec{x}$ $\vec{x}\vec{x}^T$

~ SOLUTIONS ~

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A) Complete this table:

Note: small first letters (dim, rank) are #s
Capital letters are spaces.

math symbol	acts on a ...	... to give a ...
Col	matrix	subspace of $\mathbb{R}^m$, ie a set of vectors in $\mathbb{R}^m$
rank	matrix	number $(0, 1, 2, \dots)$
dim	vector space	number $(0, 1, 2, \dots)$
Span	finite set of vectors	subspace or vector space (set of vectors)
Nul	matrix	subspace of $\mathbb{R}^n$
$[\cdot]_B$	vector	vector in $\mathbb{R}^n$

B) Circle only the meaningful terms:

Here A is a matrix, V is a vector space, $\vec{x}$ is in $\mathbb{R}^n$, $\vec{v}_j$ in V, $T: V \to V$ a transformation

A is consistent　　$A\vec{x}=\vec{b}$ is consistent

Span A　　Span$\{\vec{v}_1\}$　　$\{$Span $[\vec{v}_1, \vec{v}_2]\}$　　Span$\{V\}$

dim A　　det A　　Nul A　　dim Col A　　rank V

dim V　　Span$\{A\}$　　dim Span$\{\vec{v}_1, \vec{v}_2\}$　　Nul T　　$A\vec{x}$

A is linearly independent　　A spans $\mathbb{R}^m$　　the columns of A span $\mathbb{R}^m$　　$\{\vec{x}=\vec{0}\}$

Col $A = \mathbb{R}^m$　　Col Span A　　rank T　　$\{\vec{v}_1, \dots \vec{v}_n\}$ is lin. indep.

rank Row A　　A is onto　　each vector in $\vec{v}_1, \dots \vec{v}_n$ is lin. indep.　　$\{A\vec{x}\}$

V is a basis　　A is a basis　　$\{\vec{v}_1 \dots \vec{v}_n\}$ is a basis for V　　$\vec{x}\vec{x}$　　$\vec{x}\vec{x}^T$

BONUS ONES ...