Quiz 5

⚠ This is a preview of the published version of the quiz

Started: Oct 4 at 3:53pm

Quiz Instructions

Once you open this quiz, you will have 25 minutes to submit it. You will have only **one** submission attempt. The quiz must be **submitted** by 7:59 PM (Atlanta time) on Friday, Oct 2. There are 5 questions after the honor code pledge.

Question 1	0 pts

Please read and attest to the honor statement below:

I understand that this assessment is open-book and open-note, but not open-internet. I may use my class notes, my instructor's notes, and the ILA textbook at **https://textbooks.math.gatech.edu/ila/ila.pdf (https://textbooks.math.gatech.edu/ila/ila.pdf)** .

However, I will not visit any other websites, use any search engines, or use any calculators or computer aids whatsoever (Matlab, Mathematica, Chegg.com, Geogebra, etc.) as I take this assessment.

This assessment is completely my own work. I will not discuss the answers or any of the contents of this assessment with anyone until the time it is due.

○ I attest to my integrity, and I understand that any suspected violation of this policy may be prosecuted to the fullest extent allowable by Georgia Tech.

Question 2	1 pts

Which of the following sets of vectors is a basis for a plane in $\mathbb{R}^3$? Select all that apply.

☐ $\left\{ \begin{pmatrix} 2 \\ -1 \\ -1 \end{pmatrix}, \begin{pmatrix} -6 \\ 3 \\ 3 \end{pmatrix} \right\}$

☐ $\left\{ \begin{pmatrix} 1 \\ 0 \\ 2 \end{pmatrix}, \begin{pmatrix} -3 \\ 1 \\ 5 \end{pmatrix} \right\}$

☐ $\left\{ \begin{pmatrix} 4 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} -5 \\ 1 \\ 0 \end{pmatrix}, \begin{pmatrix} 2 \\ 2 \\ 2 \end{pmatrix} \right\}$

Question 3   1 pts

Consider the 3×5 matrix

$$A = \begin{pmatrix} 3 & -6 & -8 & -8 & 5 \\ -6 & 12 & 3 & 3 & 3 \\ -4 & 8 & 0 & 0 & 4 \end{pmatrix},$$

which can be row reduced to the following matrix:

$$\begin{pmatrix} 1 & -2 & 0 & 0 & -1 \\ 0 & 0 & 1 & 1 & -1 \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}.$$

The rank of A is [   ] .

The nullity of A is [   ] .

For a 3×5 matrix, the rank plus the nullity is always equal to [   ] .

Question 4   1 pts

Answer the following True/False questions.

(a) It is possible to have a 4×6 matrix whose rank is 3 and whose nullity is 1.

[Select] ⌄

(b) If a set of four vectors spans $\mathbb{R}^4$, then that set is a basis for $\mathbb{R}^4$.

[Select] ⌄

Question 5   1 pts

Consider the matrix

$$A = \begin{pmatrix} 1 & -1 \\ 6 & 1 \\ 4 & 6 \end{pmatrix}.$$

Let T be the matrix transformation $T(v) = Av$. Find a vector x where $T(x)$ is equal to

$$\begin{pmatrix} 1 \\ -1 \\ -6 \end{pmatrix}.$$

The answer is $x = \begin{pmatrix} a \\ b \end{pmatrix}$ where

$a = $ [_____]

$b = $ [_____] .

Question 6   **1 pts**

Consider the matrix

$$A = \begin{pmatrix} 3 & -6 & -8 & -8 & 5 \\ -6 & 12 & 3 & 3 & 3 \\ -4 & 8 & 0 & 0 & 4 \end{pmatrix},$$

which can be row reduced to the following matrix:

$$\begin{pmatrix} 1 & -2 & 0 & 0 & -1 \\ 0 & 0 & 1 & 1 & -1 \\ 0 & 0 & 0 & 0 & 0 \end{pmatrix}.$$

Let T be the matrix transformation $T(v) = Av$.

The domain of T is $\mathbb{R}^n$, where $n =$ [   ]

The codomain of T is $\mathbb{R}^m$, where $m =$ [   ] .

The range of T has dimension [   ] .

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