Midterm 2

(1) This is a preview of the published version of the quiz

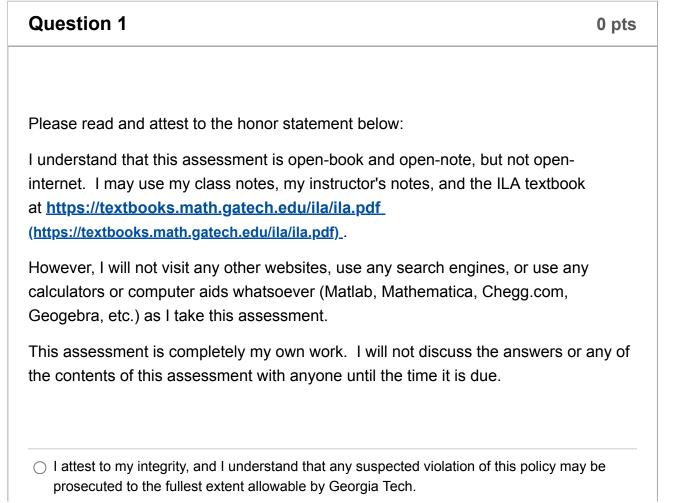
Started: Oct 20 at 3:27pm

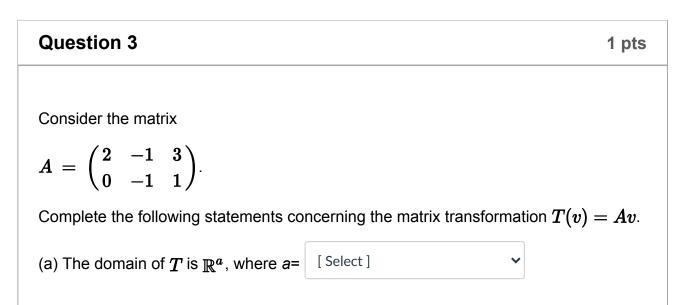
Quiz Instructions

Once you open this quiz, you will have 75 minutes to submit it. You will have only **one** submission attempt. The quiz must be **submitted** by 7:59 PM (Atlanta time) on Friday, October 16. There are 20 questions after the honor code pledge.

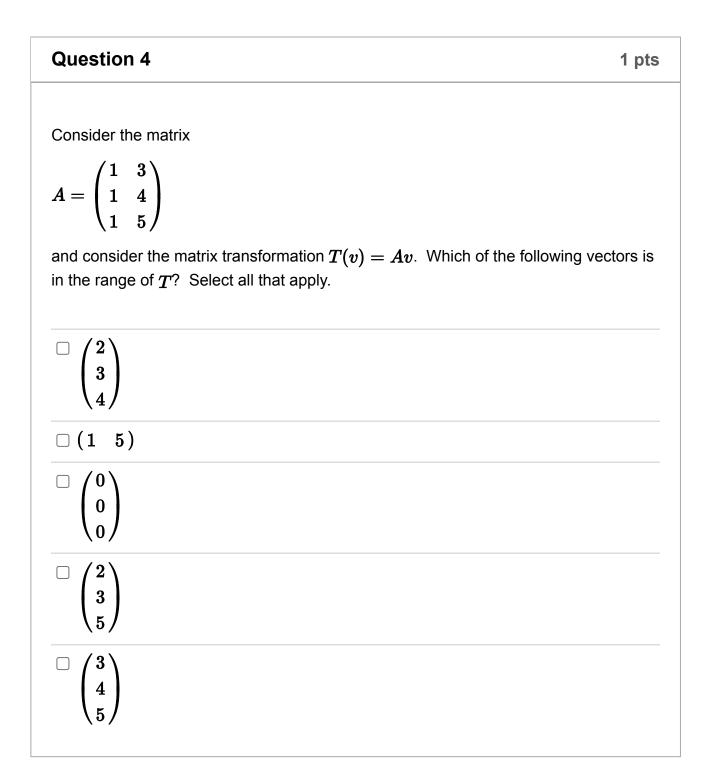
This assessment is open-book and open-note, but not open-internet. You may use my class notes, your instructor's notes, and the ILA textbook at <u>https://textbooks.math.gatech.edu/ila/ila.pdf</u> (<u>https://textbooks.math.gatech.edu/ila/ila.pdf</u>).

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





(b) The codomain of 2	Γ is \mathbb{R}^{b} , where $b=$	[Select]	~	
(c) The range of $oldsymbol{T}$ is	[Select]	~	•	

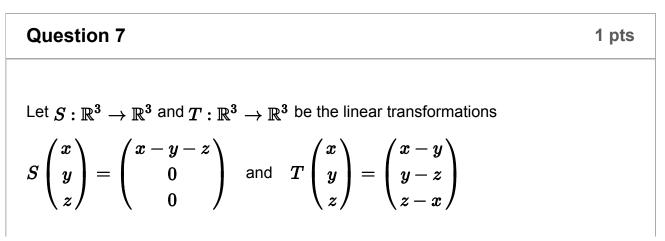


Question 5

Find a 3×2 matrix in reduced row echelon form so that the associated matrix transformation is one-to-one but not onto.



Question 6	1 pts
Find the value of h so that the following matrix is not invertible.	
$\begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & 0 \\ 2 & h & h \end{pmatrix}$	
$\begin{pmatrix} 0 & 1 & 0 \\ 2 & h & h \end{pmatrix}$	



Which of the following statements are true? Select all that apply.

$\cap T$ is not onto	
$\Box S$ is one-to-one	
$\Box T\begin{pmatrix} 1\\1\\1 \end{pmatrix} = \begin{pmatrix} -1\\0\\1 \end{pmatrix}$	
$\Box S \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix} = \begin{pmatrix} -1 \\ 0 \\ 0 \end{pmatrix}$	
$\Box \ T\circ Segin{pmatrix} 1\ 1\ 1\end{pmatrix}=egin{pmatrix} -1\ 0\ 1\end{pmatrix}$	

Question 8

1 pts

Suppose that $T: \mathbb{R}^{10} \to \mathbb{R}^1$ is a linear transformation and that its standard matrix is not the zero matrix. Which of the following statements must be true? Select all that apply.

$\Box \ T$ is one-to-one		
$\Box \ oldsymbol{T}$ is onto		
$\ \square \ oldsymbol{T}$ is invertible		
$\ \square \ T$ is not one-to-one		
$\ \ \square \ oldsymbol{T}$ is not onto		
$\ \square \ oldsymbol{T}$ is not invertible		

Question 9

Which of the following functions are linear transformations? Select all that apply.

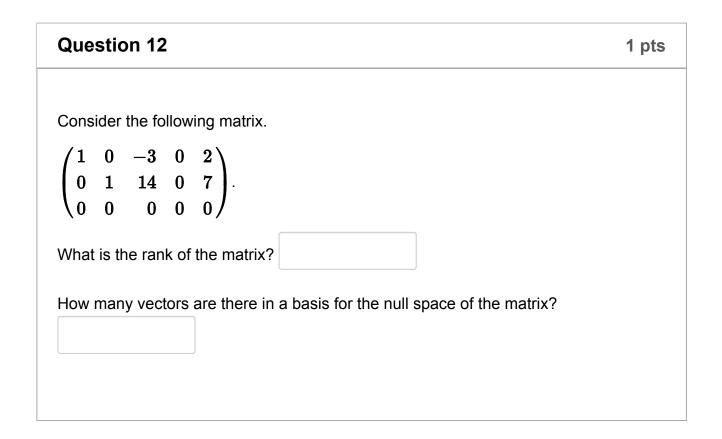
$$\Box T \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$
$$\Box T \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} z \\ y \\ x \end{pmatrix}$$
$$\Box T \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 \\ y \\ 1 \end{pmatrix}$$

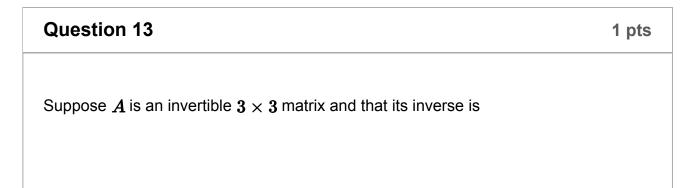
Question 10		1 pts
Suppose $oldsymbol{A}$ is a 8 $ imes$ statements is true o	< 12 matrix. Determine whether each of the following two false.	0
The dimension of th	he null space of \boldsymbol{A} must be at least 4.	
[Select]	\sim	
The dimension of th	e column space of 4 must be at least 8	
The dimension of th [Select]	the column space of A must be at least 8.	

Question 11

1 pts

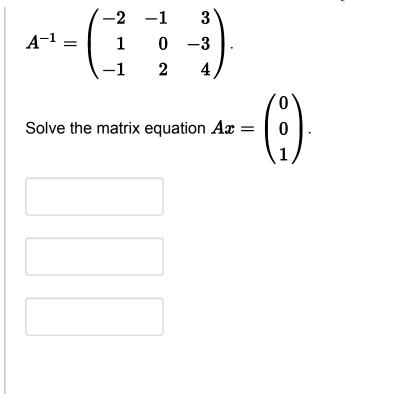
) The column spa	ce of A is a subspace of \mathbb{R}^a where $a=$	
[Select]	∽	
	of A is a subspace of \mathbb{T}^{h} where h	
The full space of	of A is a subspace of \mathbb{R}^b where $b=$	
[Select]	~	
) la itu sasible fan		~
le it nossible for	$\mathbf{C}_{\mathbf{a}}(\mathbf{A})$ to equal \mathbb{D}^{a} ? [Select]	~
) Is it possible for	$\operatorname{Col}(A)$ to equal \mathbb{R}^a ? [Select]	~





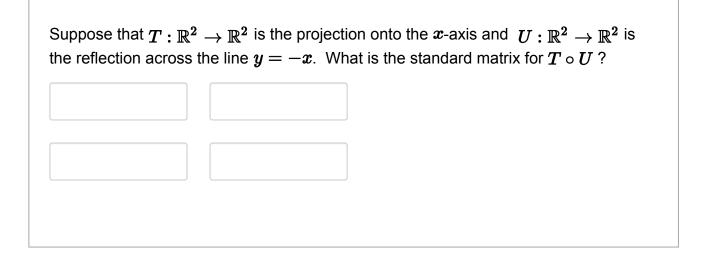
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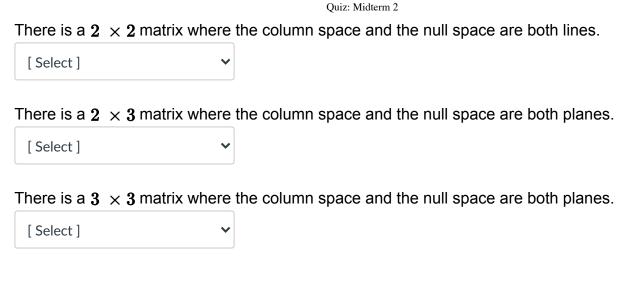
Question 14	1 pts
Suppose we have three linear transformations $T: \mathbb{R}^2 o \mathbb{R}^3$	
$egin{aligned} &I:\mathbb{R}^2 o\mathbb{R}^{4}\ &U:\mathbb{R}^3 o\mathbb{R}^3\ \end{aligned}$	
Which of the following compositions make sense? Select all that apply.	
Which of the following compositions make sense? Select all that apply. $\Box \ T \circ U$	
$\Box T \circ U$	

Question 15



Question 16	1 pts
Which of the following linear transformations is the matrix transformation for $A = \begin{pmatrix} 0 & -1 \\ -1 & 0 \end{pmatrix}$?	
\bigcirc Clockwise rotation by $oldsymbol{\pi}$ radians	
\bigcirc Dilation by —1 followed by projection onto the $m{x}$ -axis	
\bigcirc Reflection across the line $y=-x$	
\bigcirc Dilation by —1 followed by projection onto the y -axis	
\bigcirc Reflection about the line $y=x$	

Question 17		1 pts
		. .
Determine wheth	ner each of the following statements is true	or false.
	ner each of the following statements is true 2 matrix where the column space and the	



Question 18	1 pts
Solve for the matrix $oldsymbol{X}$, assuming that all matrices arising in the problem are invertible $oldsymbol{n} imes oldsymbol{n}$ matrices.	
AX = BX + C	
$^{\bigcirc} C(A-B)^{-1}$	
$^{\bigcirc} C(B-A)^{-1}$	
$^{\bigcirc} (A-B)^{-1}C$	
$^{\bigcirc} (B-A)^{-1}C$	

Question 19 1 pts Suppose that $T: \mathbb{R}^3
ightarrow \mathbb{R}^2$ is a linear transformation and that

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$$T\begin{pmatrix}1\\0\\1\end{pmatrix} = \begin{pmatrix}3\\1\end{pmatrix} \text{ and } T\begin{pmatrix}1\\0\\-1\end{pmatrix} = \begin{pmatrix}5\\1\end{pmatrix}.$$

Compute $T\begin{pmatrix}1\\0\\0\end{pmatrix}.$

Question 20		1 pts
Determine whether each	of the following three statements is true or false.	
for <i>V</i> . [Select]	bspace of \mathbb{R}^3 , then every nonzero vector in V forms	
If vectors v and w in \mathbb{R}^3 a	re not collinear, then they form a basis for a plane in	\mathbb{R}^3 .
[Select]	~	
If $v_1, v_2, v_3,$ and v_4 span	${\mathbb R}^4$, then they form a basis for ${\mathbb R}^4$.	
[Select]	~	
[



	B are $n imes n$ matrices. Let $T(v) = Av$ and $U(v) = Bv$ be the nsformations. Determine whether each of the following false.	
If $AB=I_n$, then Ba	$b = b$ is consistent for every b in \mathbb{R}^n .	
[Select]	~	
If the columns of $m{A}$ are linearly independent and the columns of $m{B}$ are linearly		
dependent then $T\circ i$	U is not onto. [Select]	
If ${oldsymbol{A}}$ and ${oldsymbol{B}}$ are both in	nvertible then $T \circ U$ is one-to-one.	
[Select]	\sim	
If $Ax = b$ is consiste	nt for every b in \mathbb{R}^n , then $Ax=0$ has infinitely many solutions.	
[Select]	~	

Not saved	Submit Quiz