Started on	Friday, 9 April 2021, 10:00:35 AM
State	Finished
Completed on	Friday, 9 April 2021, 10:50:55 AM
Time taken	50 mins 20 secs
Grade	**8.50** out of 20.00 (**43**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Flag question

If a matrix A is in row echelon form, the column vectors containing non zero leading terms of the row vectors form a basis for the column space of A .

Select one:

- (selected) True
- False

The correct answer is 'True'.

Question **2**

Correct

Mark 1.00 out of 1.00

Flag question

If $T:\mathbb{R}^2 \to \mathbb{R}^2$ rotates vectors about the origin through an angle θ , then T is a linear transformation.

Select one:

- (selected) True
- False

The correct answer is 'True'.

Question **3**

Correct

Mark 1.00 out of 1.00

Flag question

Any set of n generating vectors in an n-dimensional vector space is a basis.

Select one:

- (•) True
- ( ) False

The correct answer is 'True'.

Question **4**

Correct

Mark 1.00 out of 1.00

Flag question

Let W be the subspace of dimension 1342 of vector space $\mathbb{R}^{2021}$. Then the dimension of subspace $W^{\perp}$ is

Answer: 679

The correct answer is: 679

Question **5**

Correct

Mark 1.00 out of 1.00

Flag question

True or False

Let A be an $n \times n$ matrix such that $\det(A) = 0$, then 0 is one of the eigenvalues of A.

Select one:

- (selected) True
- False

The correct answer is 'True'.

Question **6**

Incorrect

Mark 0.00 out of 2.00

Flag question

The dimension of row space of the given matrix $\begin{bmatrix} 1 & 2 & -1 & 1 \\ 2 & 1 & -1 & 4 \\ 1 & -4 & 1 & 5 \end{bmatrix}$ is

Select one or more:

- [ ] 1
- [ ] 2
- [ ] 4
- [x] 3

The correct answer is: 2

Question **7**

Partially correct

Mark 1.00 out of 2.00

Flag question

Select the correct answer: True or False.

True	False	
(selected)		This choice was deleted after the attempt was started.

True	False	
(•)	( )	This choice was deleted after the attempt was started.
( )	(•)	Let S: $\mathbb{R}^3 \to \mathbb{R}$ be a mapping defined by $S(x,y,z) = \|x+y+z\|$, then S is linear map.
(•)	( )	A homogeneous system of linear equations with fewer unknowns than equations has a nonzero solution.

This choice was deleted after the attempt was started.: False
This choice was deleted after the attempt was started.: False
Let S: $\mathbb{R}^3 \to \mathbb{R}$ be a mapping defined by $S(x,y,z) = |x+y+z|$, then S is linear map.
: False
A homogeneous system of linear equations with fewer unknowns than equations has a nonzero solution.: False

Question **8**

Partially correct

Mark 0.50 out of 2.00

Flag question

Let L:$\mathbb{R}^3 \to \mathbb{R}^3$ be a linear map defined by $L(x_1, x_2, x_3) = (x_1 + x_3, x_3 + 2x_2 - x_1, x_2 - x_1)$.
Let A be the matrix of L.

Kernel of L is [span{(1,1,-1), (0,0,0)}] .

Image of L is [span{(1,0,0), (-1,1,0), (0,0,0)}] .

Dimension of row space of A is [3] .

Dimension of null space of A is [2] .

span{(2,0,-1), (-1,0, 0.5), (-1,0,0)}

1

3

span{(0,2,1), (-2,-2,0), (2,0,-1)}

span{(0,0,1), (-1,0,0), (0,2,0)}

The correct answer is:
Let $L:\mathbb{R}^3 \to \mathbb{R}^3$ be a linear map defined by $L(x_1, x_2, x_3) = (x_1 + x_3, x_3 + 2x_2 - x_1, x_2 - x_1)$.
Let A be the matrix of L.

Kernel of L is [span{(1,1,-1), (0,0,0)}].

Image of L is [span{(0,2,1), (-2,-2,0), (2,0,-1)}].

Dimension of row space of A is [2].

Dimension of null space of A is [1].

Question **9**

Correct

Mark 2.00 out of 2.00

Flag question

Let $T:\mathbb{R}^2 \to \mathbb{R}^3$ be a linear map defined as $T(x, y) = (x+3y, 2x+5y, 7x+9y)$, Matrix associated with map T with respect to the ordered basis $\{(1, 0), (1, 1)\}$ of $\mathbb{R}^2$ and the ordered basis $\{(1, 1, 1), (1, 1, 0), (1, 0, 0)\}$ of $\mathbb{R}^3$ is

- $\begin{bmatrix} 16 & -9 & -3 \\ 7 & -5 & -1 \end{bmatrix}$
- $\begin{bmatrix} 16 & 7 \\ -9 & -5 \\ -3 & -1 \end{bmatrix}$
- $\begin{bmatrix} 7 & 16 \\ -5 & -9 \\ -1 & -3 \end{bmatrix}$
-

$\begin{bmatrix} 7 & -5 & -1 \\ 16 & -9 & -3 \end{bmatrix}$

The correct answer is: $\begin{bmatrix} 7 & 16 \\ -5 & -9 \\ -1 & -3 \end{bmatrix}$

Question **10**

Incorrect

Mark 0.00 out of 2.00

Flag question

Let $A = \begin{pmatrix} -1 & 2 & 0 \\ -6 & 6 & 0 \\ 0 & 0 & 3 \end{pmatrix}$. Dimension of the eigenspace of the largest eigenvalue of A is...

*Note: Write your answer as a numerical value.

Answer: 3

The correct answer is: 2

Question **11**

Incorrect

Mark 0.00 out of 2.00

Flag question

Let A be a 7×7 matrix and -3 is one of the eigenvalues of A then which of the following are eigenvalues of $9I - 5A - 2A^3$, A^{-1}, PAP^{-1} respectively where P is an invertible matrix?

Select one:

- -30,
  -1/3,
  3
- 30,
  1/3,
  -3
- 78,
  -1/3,
  -3

- -78,
  -1/3,
  -3

The correct answer is: 78, -1/3, -3

Question **12**

Not answered

Marked out of 3.00

Flag question

Drag the correct answers:

Let $\mathbb{P}_2(\mathbb{R})$ be the vector space of polynomials in x of degree at most 2 and $T\colon \mathbb{P}_2(\mathbb{R}) \to \mathbb{M}_2(\mathbb{R})$ be a linear map such that $T(1) = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$, $T(x) = \begin{pmatrix} 1 & -1 \\ -1 & 1 \end{pmatrix}$ and $T(x^2) = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$. Then $Im(T)$ is [ ], and a pre-image of $\begin{pmatrix} 1 & 5 \\ 5 & 1 \end{pmatrix}$ under T is [ ]

- a proper subspace of vector space of symmetric matrices
- a subspace of vector space of symmetric matrices
- a proper subspace of vector space of skew-symmetric matrices
- a subspace of vector space of skew-symmetric matrices
- 3-2x+7x^2
- 2-3x+7x^2
- 3+2x-7x^2

The correct answer is:
Drag the correct answers:

Let $\mathbb{P}_2(\mathbb{R})$ be the vector space of polynomials in x of degree at most 2 and $T\colon \mathbb{P}_2(\mathbb{R}) \to \mathbb{M}_2(\mathbb{R})$ be a linear map such that $T(1) = \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$, $T(x) = \begin{pmatrix} 1 & -1 \\ -1 & 1 \end{pmatrix}$ and $T(x^2) = \begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$. Then $Im(T)$ is [a proper subspace of vector space of symmetric matrices], and a pre-image of $\begin{pmatrix} 1 & 5 \\ 5 & 1 \end{pmatrix}$ under T is [3-2x+7x^2]

Save the state of the flags