



Virtual University

About Us

MTH501
Solved Final Term Paper 5

Waqar.siddhu@gmail.com

Year
2017

For More Plz Visit

WWW.VirtualAcademyLive.com

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

In the Name of Allāh, the Most Gracious, the Most Merciful

Paper Pattern

MCQS 40 each 1 mark
Short 4 each 2 marks
Short 4 each 3 marks
long 4 each 5 marks

Question No : 1 of 52

Marks: 1 (Budgeted Time 1 Min)

Which statement about the General Least Square Method is true?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐

Solution obtained by this method is always unique.

☐

This is a numerical method for the solution of System of Linear Equations.

☒

This method find an x that makes Ax as close as possible to the b .

correct

☐

This method gives us exact solution of the system.

Made by: Waqar Siddhu

Question No : 2 of 52

Marks: 1 (Budgeted Time 1 Min)

Let $v = (1, -2, 2, 0)$. The unit vector in the same direction as v is

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐

$\left(\frac{1}{3}, \frac{2}{3}, \frac{2}{3}, 0\right)$

☒

$\left(\frac{1}{3}, -\frac{2}{3}, \frac{2}{3}, 0\right)$

correct

☐

$\left(-\frac{1}{3}, \frac{2}{3}, -\frac{2}{3}, 0\right)$

☐

$\left(\frac{1}{3}, -\frac{2}{3}, \frac{2}{3}, \frac{1}{3}\right)$

Made by: Waqar Siddhu

Question No : 3 of 52

Marks: 1 (Budgeted Time 1 Min)

Let $u = (3, -2), v = (4, 5)$. For the weighted Euclidean inner product $\langle u, v \rangle = 4u_1v_1 + 5u_2v_2$
 $\langle v, u \rangle =$

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ 2☐ -2☐ 3☐ -3

Made by: Waqar Siddhu

Question No : 4 of 52

Marks: 1 (Budgeted Time 1 Min)

Let $v = (0, 2, 2, 1)$. The unit vector in the same direction as v is

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $\left(0, \frac{2}{3}, \frac{2}{3}, \frac{-1}{3}\right)$ ☐ $\left(0, \frac{-2}{3}, \frac{2}{3}, \frac{-1}{3}\right)$ ☐ $\left(0, \frac{2}{3}, \frac{2}{3}, \frac{1}{3}\right)$ ☐ $\left(0, \frac{-2}{3}, \frac{2}{3}, \frac{1}{3}\right)$

Made by: Waqar Siddhu

Question No : 5 of 52

Marks: 1 (Budgeted Time 1 Min)

Let \mathbb{R}^3 have the Euclidean inner product. Then $u = (2, 1, 3), v = (1, 7, k)$ are orthogonal for

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $k = 9$ ☐ $k = -3$ ☐ $k = -9$ ☐ $k = 3$

Made by: Waqar Siddhu

Question No : 6 of 52

Marks: 1 (Budgeted Time 1 Min)

Let A be $n \times n$ matrix whose entries are real. If λ is an eigenvalue of A with x a corresponding eigenvector in \mathbb{R}^n , then

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $A\bar{x} = \lambda\bar{x}$

☐ $Ax = \bar{\lambda}x$

☐ $A\bar{x} = \bar{\lambda}x$

☐ $Ax = \lambda^{-1}\bar{x}$

Made by: Waqar Siddhu

Question No : 7 of 52

Marks: 1 (Budgeted Time 1 Min)

Suppose that $A = \begin{bmatrix} 1.25 & -.75 \\ -.75 & 1.25 \end{bmatrix}$ has eigenvalues 2 and 0.5. Then origin is a

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ Saddle point

correct

☐ Repellor

☐ Attractor

Made by: Waqar Siddhu

Question No : 8 of 52

Marks: 1 (Budgeted Time 1 Min)

Suppose that $A = \begin{bmatrix} 0.5 & 0.6 \\ -0.3 & 1.4 \end{bmatrix}$ has eigenvalues 0.8 and 1.1. Then origin is a

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ Saddle point

correct

☐ Repellor

☐ Attractor

Made by: Waqar Siddhu

Question No : 9 of 52

Marks: 1 (Budgeted Time 1 Min)

If A is an $m \times n$ matrix with linearly independent column vectors, then A can be factored as

$$A = QR$$

Where Q is an $m \times n$ matrix with orthonormal column vectors, and R is an $n \times n$

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com
☐ Upper triangular matrix

correct

☐ Invertible matrix

☐ Invertible lower triangular matrix

☐ Invertible upper triangular matrix

Made by: Waqar Siddhu

Question No : 10 of 52

Marks: 1 (Budgeted Time 1 Min)

The matrix equation $A^T A \hat{x} = A^T b$ represents a system of linear equations commonly referred to as the

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com
☐ normal equations for x
☐ normal equations for \hat{x}
☐ normal equations for A
☐ normal equations for b

Made by: Waqar Siddhu

Question No : 11 of 52

Marks: 1 (Budgeted Time 1 Min)

By the Best Approximation Theorem, the distance from y to W is $\|y - \hat{y}\|$, where $\hat{y} =$

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com
☐ $\text{proj}_W \hat{y}$
☐ $\text{proj}_W y$

correct

☐ $\text{proj}_W W$

Made by: Waqar Siddhu

Question No : 12 of 52

Marks: 1 (Budgeted Time 1 Min)

$\|u + v + w\| \leq \|u\| + \|v\| + \|w\|$ for all vectors u, v and w in an inner product space.

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

True

☐

correct

False

☐

Made by: Waqar Siddhu

Question No : 13 of 52

Marks: 1 (Budgeted Time 1 Min)

The dominant eigenvalue for the matrix $A = \begin{bmatrix} 0 & 0 & 2 & 0 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & -3 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$ is

 $\lambda = 1$ ☐ $\lambda = -3$ ☐

correct

 $\lambda = -1$ ☐ $\lambda = 0$ ☐

Made by: Waqar Siddhu

Question No : 14 of 52

Marks: 1 (Budgeted Time 1 Min)

A square matrix A is invertible if and only if $x = 0$ is not an eigen value of A .

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

True

☐

correct

False

☐

Made by: Waqar Siddhu

Question No : 15 of 52

Marks: 1 (Budgeted Time 1 Min)

A square matrix with orthogonal columns _____ matrix. (Click on most appropriate)

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

- ☐ is an orthogonal
- ☐ may be an orthogonal
- ☐ may not be an orthogonal
- ☐ is not an orthogonal

Made by: Waqar Siddhu

Question No : 16 of 52

Marks: 1 (Budgeted Time 1 Min)

If two rows are orthogonal, they are _____.

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

- ☐ linearly independent
- ☐ linearly dependent

Made by: Waqar Siddhu

Question No : 17 of 52

Marks: 1 (Budgeted Time 1 Min)

If x is orthogonal to both u and v , then x must be _____ to $u + v$.

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

- ☐ orthogonal
- ☐ orthonormal
- ☐ perpendicular
- ☐ parallel

Made by: Waqar Siddhu

Question No : 18 of 52

Marks: 1 (Budgeted Time 1 Min)

The given system $\begin{matrix} 2x + 3y = 3 \\ 6x + 9y = 7 \end{matrix}$ has

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com☐ Unique solution☐ Infinitely many solutions☐ No solution☐ None of these**Made by: Waqar Siddhu**

Question No : 19 of 52

Marks: 1 (Budgeted Time 1 Min)

Which statement about the matrix $\begin{bmatrix} 1 & 0 & 0 & 0 \\ 7 & 2 & 0 & 0 \\ 9 & 1 & 2 & 0 \\ 5 & 4 & 2 & -1 \end{bmatrix}$ is false?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com☐ Eigenvalue 2 has Algebraic multiplicity 1☐ Eigenvalue of the matrix are 1, 2 and -1.☐ Characteristic polynomial of the matrix is $(1-\lambda)(2-\lambda)^2(-1-\lambda)$.☐ Eigenvalue -1 has multiplicity 1.**Made by: Waqar Siddhu**

Question No : 20 of 52

Marks: 1 (Budgeted Time 1 Min)

If $A = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}$ is diagonalizable then A has 2 distinct eigenvalues.

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com☐ True☐ False**Made by: Waqar Siddhu**

Question No : 21 of 52

Marks: 1 (Budgeted Time 1 Min)

A is diagonalizable if $A = PDP^{-1}$ Where

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐

D is any matrix and P is an invertible matrix

☐

D is a diagonal matrix and P is any matrix

☐

D is a diagonal matrix and P is invertible matrix

☐

D is a invertible matrix and P is any matrix

Made by: Waqar Siddhu

Question No : 22 of 52

Marks: 1 (Budgeted Time 1 Min)

Which statement is FALSE.

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐If $Ax = \lambda x$ for some real number λ then λ is known as eigenvalue of the matrix A.☐

The eigenvalues of any matrix are on its main diagonal.

☐In order to find the eigenvalues we solve the equation $|A - \lambda I| = 0$ ☐

An eigenspaces of A is the Null space of some matrix.

Made by: Waqar Siddhu

Question No : 23 of 52

Marks: 1 (Budgeted Time 1 Min)

How many terms are there in the algebraic expression $8x^2 + \sqrt{9}x \times 25x^3$?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐

4

☐

3

☐

2

☐

1

Made by: Waqar Siddhu

Question No : 24 of 52

Marks: 1 (Budgeted Time 1 Min)

If two matrices are added, then which of the following should be true for them?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com
☐

Both must have same order.

☐

Both must have different order.

☐

Both must be rectangular.

☐

Both must be square.

Made by: Waqar Siddhu

Question No : 25 of 52

Marks: 1 (Budgeted Time 1 Min)

If a matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ 6 & 1 & 1 \end{bmatrix}$, then which of the following is true for A ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com
☐

It is a rectangular matrix.

☐

It is a row matrix.

☐

It is a singular matrix.

☐

It is a scalar matrix.

Made by: Waqar Siddhu

Question No : 26 of 52

Marks: 1 (Budgeted Time 1 Min)

If \vec{v}_1, \vec{v}_2 and \vec{v}_3 are in R^3 then which of the following is equivalent to $[\vec{v}_1 \ \vec{v}_2 \ \vec{v}_3] \begin{bmatrix} 2 \\ -7 \\ 5 \end{bmatrix}$?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com
☐ $2\vec{v}_1 - 7\vec{v}_2 + 5\vec{v}_3$ ☐ $5\vec{v}_1 - 7\vec{v}_2 + 2\vec{v}_3$ ☐ $5\vec{v}_1 + 2\vec{v}_2 - 7\vec{v}_3$ ☐ $2\vec{v}_1 + 5\vec{v}_2 - 7\vec{v}_3$

Made by: Waqar Siddhu

Question No : 27 of 52

Marks: 1 (Budgeted Time 1 Min)

If $\{\vec{v}_1, \vec{v}_2, \vec{v}_3\}$ is linearly dependent set and $\vec{v}_1 \neq c \vec{v}_2$ (where 'c' is a scalar), then which option is true?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $\vec{v}_1 \in \text{Span}\{\vec{v}_1, \vec{v}_2\}$

☐ $\vec{v}_2 \in \text{Span}\{\vec{v}_1, \vec{v}_2\}$

☐ $\vec{v}_3 \in \text{Span}\{\vec{v}_1, \vec{v}_2\}$

☐ $\vec{v}_3 \notin \text{Span}\{\vec{v}_1, \vec{v}_2\}$

Made by: Waqar Siddhu

Question No : 28 of 52

Marks: 1 (Budgeted Time 1 Min)

If $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 0 & 1 \\ 0 & -1 & 1 \end{bmatrix}$, then which of the following is true for the matrix A ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ It is an invertible matrix.

☐ It is a singular matrix.

☐ It is a non-invertible matrix.

☐ It is a rectangular matrix.

Made by: Waqar Siddhu

Question No : 29 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following is true for the partitioned matrices $A = \begin{bmatrix} C & D \end{bmatrix}$ and $B = \begin{bmatrix} E & F \end{bmatrix}$, where sub-matrices C and D have the same sizes as E and F respectively ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $A + B = \begin{bmatrix} CE & DF \end{bmatrix}$

☐ $A + B = \begin{bmatrix} C + E \\ D + F \end{bmatrix}$

☐ $A + B = \begin{bmatrix} C + E & D + F \end{bmatrix}$

☐ $A + B = \begin{bmatrix} CE \\ DF \end{bmatrix}$

Made by: Waqar Siddhu

Question No : 30 of 52

Marks: 1 (Budgeted Time 1 Min)

If a matrix A is factorized into lower and upper triangular matrices, then which of the following is true for the matrix?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com☐

It is called an LU -procedure.

☐

It is called an LU -decomposition.

☐

It is called an LU -matrices.

☐

It is called an LU -algorithm.

Made by: Waqar Siddhu

Question No : 31 of 52

Marks: 1 (Budgeted Time 1 Min)

If the matrix $A = \begin{bmatrix} 1 & 5 & 4 \\ 0 & 1 & 7 \\ 0 & 0 & 0 \end{bmatrix}$, then which of the following is true about it?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com☐

Its determinant is 0.

☐

Its determinant is 2.

☐

Its determinant is 4.

☐

Its determinant is 6.

Made by: Waqar Siddhu

Question No : 32 of 52

Marks: 1 (Budgeted Time 1 Min)

Let a set S is a basis of a vector space V , then which of the following is NOT true about it?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com☐

It is linearly dependent.

☐

Each element of S belongs to V .

☐

It spans V .

☐

It is linearly independent.

Made by: Waqar Siddhu

Question No : 33 of 52

Marks: 1 (Budgeted Time 1 Min)

If $B = \left\{ \begin{pmatrix} 0 \\ 1 \end{pmatrix}, \begin{pmatrix} 2 \\ 0 \end{pmatrix} \right\}$ for R^2 and an $\vec{x} \in R^2$ has coordinate vector $[\vec{x}]_B = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$, then which of the following is the value of \vec{x} ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $\vec{x} = \begin{pmatrix} 6 \\ 1 \end{pmatrix}$

☐ $\vec{x} = \begin{pmatrix} 2 \\ 0 \end{pmatrix}$

☐ $\vec{x} = \begin{pmatrix} 0 \\ 1 \end{pmatrix}$

☐ $\vec{x} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$

Made by: Waqar Siddhu

Question No : 34 of 52

Marks: 1 (Budgeted Time 1 Min)

If a set $S = \{1, x, x^2\}$ is a basis for p_2 and $[\vec{p}]_S = (2, 4, 7)$, then which of the following is the most appropriate option ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $p_2 = 2 - 4x + 7x^2$

☐ $p_2 = 2 - 4x - 7x^2$

☐ $p_2 = 2 + 4x + 7x^2$

☐ $p_2 = 4x - 7x^2$

Made by: Waqar Siddhu

Question No : 35 of 52

Marks: 1 (Budgeted Time 1 Min)

Which of the following is the set of standard basis for R^3 ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $\{(1, 1, 0), (0, 1, 0), (1, 0, 1)\}$

☐ $\{(1, 0, 0), (0, 1, 0), (0, 0, 1)\}$

☐ $\{(1, 0, 0), (1, 1, 0), (0, 0, 1)\}$

☐ $\{(1, 0, 0), (0, 1, 0), (1, 1, 1)\}$

Made by: Waqar Siddhu

Question No : 36 of 52

Marks: 1 (Budgeted Time 1 Min)

Consider the bases for R^2 given by $B = \{ \overset{\uparrow}{b}_1, \overset{\uparrow}{b}_2 \}$ and $C = \{ \overset{\uparrow}{c}_1, \overset{\uparrow}{c}_2 \}$; where $\overset{\uparrow}{b}_1 = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$, $\overset{\uparrow}{b}_2 = \begin{bmatrix} -1 \\ 1 \end{bmatrix}$, $\overset{\uparrow}{c}_1 = \begin{bmatrix} -5 \\ 3 \end{bmatrix}$, $\overset{\uparrow}{c}_2 = \begin{bmatrix} -2 \\ 1 \end{bmatrix}$, also assume that $P_{B \leftarrow C} = \begin{bmatrix} -2 & -1 \\ 3 & 1 \end{bmatrix}$; then which of the following is the change-of-coordinates matrix from B to C ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $P_{C \leftarrow B} = \begin{bmatrix} 1 & 1 \\ -3 & -2 \end{bmatrix}$

☐ $P_{C \leftarrow B} = \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$

☐ $P_{C \leftarrow B} = \begin{bmatrix} -5 & -2 \\ 3 & 1 \end{bmatrix}$

☐ $P_{C \leftarrow B} = \begin{bmatrix} -8 & -3 \\ 3 & 1 \end{bmatrix}$

Made by: Waqar Siddhu

Question No : 37 of 52

Marks: 1 (Budgeted Time 1 Min)

If the general term of a typical signal is $(0.6)^k$, then determine which of the following is the signal for $k = -2$?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ $(0.6)^{-2} = 0$

☐ $(0.6)^{-2} = 0.6$

☐ $(0.6)^{-2} = (0.6)^2$

☐ $(0.6)^{-2} = 1/(0.6)^2$

Made by: Waqar Siddhu

Question No : 38 of 52

Marks: 1 (Budgeted Time 1 Min)

If the Casorati matrix is not invertible , then which of the following is the most appropriate option regarding the associated signals ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

☐ The signals are linearly independent .

☐ The signals are linearly dependent .

☐ The signals may or may not dependent .

☐ The signals may or may not independent .

Made by: Waqar Siddhu

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

If $\{y_k\} = \{\dots, 1, 0.7, 0, -0.7, -1, -0.7, 0, 0.7, 1, 0.7, 0, \dots\}$ and $0.35y_{k+2} + 0.6y_{k+1} + 0.42y_k = z_k$;

$$\uparrow$$

$$k = 0$$

then which of the following is the value of z_0 ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

0.840

C

0.049

C

-0.770

C

-1.139

C

Made by: Waqar Siddhu

Question No : 39 of 52

Marks: 1 (Budgeted Time 1 Min)

If $\{y_k\} = \{\dots, 1, 0.7, 0, -0.7, -1, -0.7, 0, 0.7, 1, 0.7, 0, \dots\}$ and $0.35y_{k+2} + 0.6y_{k+1} + 0.42y_k = z_k$;

$$\uparrow$$

$$k = 0$$

then which of the following is the value of z_0 ?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

0.840

C

0.049

C

-0.770

C

-1.139

C

Made by: Waqar Siddhu

Question No : 40 of 52

Marks: 1 (Budgeted Time 1 Min)

Suppose that $B = \{b_1, b_2\}$ is a basis for V and $C = \{c_1, c_2, c_3\}$ is a basis for W . Let $T: V \rightarrow W$ be a linear transformation with the property that $T(b_1) = 5c_1 - 2c_2 + 3c_3$ and $T(b_2) = 4c_1 - c_2 + 7c_3$. Determine the value of $[T(b_2)]_C$?

Answer (Please select your correct option)

WWW.VirtualAcademyLive.com

$$\begin{bmatrix} 5 \\ -2 \\ 3 \end{bmatrix}$$

C

$$\begin{bmatrix} 7 \\ -1 \\ 4 \end{bmatrix}$$

C

$$\begin{bmatrix} 4 \\ -1 \\ 7 \end{bmatrix}$$

C

$$\begin{bmatrix} 3 \\ -2 \\ 7 \end{bmatrix}$$

C

Made by: Waqar Siddhu

Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

Determine whether the set of vectors are orthogonal or not.

$$\begin{bmatrix} 5 \\ -4 \\ 0 \end{bmatrix}, \begin{bmatrix} -4 \\ 1 \\ -3 \end{bmatrix}, \begin{bmatrix} 3 \\ 3 \\ 5 \end{bmatrix}$$

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com



Made by: Waqar Siddhu

Question No : 41 of 52

Marks: 2 (Budgeted Time 4 Min)

$$\begin{bmatrix} 5 \\ -4 \\ 0 \\ 3 \end{bmatrix}, \begin{bmatrix} -4 \\ 1 \\ -3 \\ 8 \end{bmatrix}, \begin{bmatrix} 3 \\ 3 \\ 5 \\ 1 \end{bmatrix}$$

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com



Made by: Waqar Siddhu

Question No : 42 of 52

Marks: 2 (Budgeted Time 4 Min)

Is the following set of vectors is orthogonal with respect to the Euclidean inner product on \mathbb{R}^3 ?

$$\left(\frac{1}{\sqrt{6}}, \frac{1}{\sqrt{6}}, -\frac{2}{\sqrt{6}} \right), \left(\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}, 0 \right)$$

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com



Made by: Waqar Siddhu

Question No : 43 of 52

Marks: 2 (Budgeted Time 4 Min)

If a matrix $A = \begin{bmatrix} 1 & 4 & 5 \\ 4 & 5 & 6 \\ 7 & 8 & 8 \end{bmatrix}$ and $\det(A^T) = 6$, then find the determinant of the matrix .

Answer (Please [click here](#) to Add Answer)

WWW.VirtualAcademyLive.com



Made by: Waqar Siddhu

Question No : 44 of 52

Marks: 2 (Budgeted Time 4 Min)

Let $B = \{b_1, b_2, b_3\}$ and $D = \{d_1, d_2\}$ be bases for vector spaces V and W , respectively . Let $T : V \rightarrow W$ be a linear transformation with the property that $T(b_1) = 3d_1 - 5d_2$, $T(b_2) = -d_1 + 6d_2$ and $T(b_3) = 4d_2$. Find a matrix M for T relative to B and D .

Answer (Please [click here](#) to Add Answer)

WWW.VirtualAcademyLive.com



Made by: Waqar Siddhu

Question No : 45 of 52

Marks: 3 (Budgeted Time 6 Min)

Determine whether the vectors $y = \begin{bmatrix} -3 \\ 7 \\ 4 \\ 0 \end{bmatrix}$, $z = \begin{bmatrix} 1 \\ -8 \\ 15 \\ -7 \end{bmatrix}$ are orthogonal.

Answer (Please [click here](#) to Add Answer)

WWW.VirtualAcademyLive.com



Made by: Waqar Siddhu

Question No : 46 of 52

Marks: 3 (Budgeted Time 6 Min)

Let $W = \text{Span} \{x_1, x_2\}$, where $x_1 = \begin{bmatrix} 3 \\ 0 \\ -1 \end{bmatrix}$, $x_2 = \begin{bmatrix} 8 \\ 5 \\ -6 \end{bmatrix}$. Construct an orthogonal basis (v_1, v_2) for W .

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com



Made by: Waqar Siddhu

Question No : 47 of 52

Marks: 3 (Budgeted Time 6 Min)

If $A = \begin{pmatrix} 1 & 2 \\ 2 & 1 \end{pmatrix}$ then find an invertible matrix P such that $P^{-1}AP = D$ (diagonal matrix)

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com



Made by: Waqar Siddhu

Question No : 48 of 52

Marks: 3 (Budgeted Time 6 Min)

Let $\vec{v}_1 = \begin{bmatrix} 1 \\ 0 \\ -2 \end{bmatrix}$, $\vec{v}_2 = \begin{bmatrix} -2 \\ 1 \\ 7 \end{bmatrix}$ and $\vec{y} = \begin{bmatrix} h \\ -3 \\ -5 \end{bmatrix}$. For what value(s) of ' h ' is \vec{y} in the plane generated by \vec{v}_1 and \vec{v}_2 ?

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com



Made by: Waqar Siddhu

Question No : 49 of 52

Marks: 5 (Budgeted Time 10 Min)

Compute the least square error associated with the least square solution $\hat{x} = \begin{bmatrix} 4 \\ 3 \\ -1 \\ 3 \end{bmatrix}$ of the equation $Ax = b$ where $A = \begin{bmatrix} 1 & -2 \\ -1 & 2 \\ 0 & 3 \\ 2 & 5 \end{bmatrix}$, $b = \begin{bmatrix} 3 \\ 1 \\ -4 \\ 2 \end{bmatrix}$

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com

**Made by: Waqar Siddhu**

Question No : 50 of 52

Marks: 5 (Budgeted Time 10 Min)

Find the dominant Eigen pair (i.e. the Eigen value and Eigen vector) by using the Power Method for the following matrix. (Perform only 1 iteration)

$$A = \begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}, \quad x_0 = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$$

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com

**Made by: Waqar Siddhu**

Question No : 51 of 52

Marks: 5 (Budgeted Time 10 Min)

Find A^2 , given that $A = PDP^{-1}$, where P and D are given below $A = \begin{bmatrix} 2 & 6 \\ -4 & 12 \end{bmatrix}$, $P = \begin{bmatrix} 3 & 1 \\ 2 & 1 \end{bmatrix}$, $D = \begin{bmatrix} 6 & 0 \\ 0 & 8 \end{bmatrix}$, $P^{-1} = \begin{bmatrix} 1 & -1 \\ -2 & 3 \end{bmatrix}$

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com

**Made by: Waqar Siddhu**

Let $A = \begin{bmatrix} 1 & 4 \\ 5 & 6 \end{bmatrix}$ and $\vec{c} = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$. Define $T: \mathbb{R}^2 \rightarrow \mathbb{R}^2$ by $T(\vec{x}) = A\vec{x}$. Determine if \vec{c} is in the range of the transformation T .

Answer ([Please click here to Add Answer](#))

WWW.VirtualAcademyLive.com

Rich text editor toolbar with icons for Bold, Italic, Underline, Text Color, Background Color, Bulleted List, Numbered List, Indent, Outdent, Link, Unlink, and a 100% zoom level.

Normal Arial 12 B I U

Made by: Waqar Siddhu