



MTH641: Quiz 2

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Question # 10 of 10

SOLVED BY: **WAQAR HUSSAIN**

Every normed space is a

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

- | | | |
|---|--|---|
| <input type="radio"/> | Banach space |  |
| <input type="radio"/> | Metric space |  |
| <input type="radio"/> | Null space |  |
|  | Vector space with a metric defined by norm |  |

(Module 48, Pg.61)

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Question # 9 of 10

SOLVED BY: **WAQAR HUSSAIN**

Space l^p is

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Select the correct option

- Complete vector space 
- Null space 
- Banach space 
- Incomplete normed space 



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Question # 8 of 10

SOLVED BY: **WAQAR HUSSAIN**

Space $C[a, b]$ is



Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

- | | | |
|----------------------------------|-------------------------|--|
| <input type="radio"/> | complete vector space | |
| <input type="radio"/> | Real space | |
| <input type="radio"/> | Incomplete normal space | |
| <input checked="" type="radio"/> | Banach space | |

(Module 40, Pg.51 Conceptual)

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Question # 7 of 10

SOLVED BY: **WAQAR HUSSAIN**

l^2 is

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Select the correct option

- | | | |
|----------------------------------|----------------------|---|
| <input type="radio"/> | finite dimensional |  |
| <input checked="" type="radio"/> | infinite dimensional |  |
| <input type="radio"/> | not a vector space |  |
| <input type="radio"/> | zero vector space |  |

(Module 39, Pg.49)

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Question # 6 of 10

SOLVED BY: **WAQAR HUSSAIN**

$C[a, b]$ is

Select the correct option

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Finite dimensional



Not a vector space



Infinite dimensional

(Module 39, Pg.49)



Zero or dimensional



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Question # 5 of 10

SOLVED BY: **WAQAR HUSSAIN**

Identity operator is

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Select the correct option

- | | | |
|----------------------------------|------------------------|--|
| <input checked="" type="radio"/> | linear operator | |
| <input type="radio"/> | non linear operator | |
| <input type="radio"/> | Zero operator | |
| <input type="radio"/> | discontinuous operator | |





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Question # 4 of 10

SOLVED BY: **WAQAR HUSSAIN**

Vector space x is called real vector spaces if



Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

- | | | |
|----------------------------------|------------------|--------------------|
| <input type="radio"/> | $K = \mathbb{Q}$ | |
| <input checked="" type="radio"/> | $K = \mathbb{R}$ | (Module 37, Pg.45) |
| <input type="radio"/> | $K = \mathbb{C}$ | |
| <input type="radio"/> | $K = \mathbb{N}$ | |

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Question # 3 of 10

SOLVED BY: **WAQAR HUSSAIN**

Elements of field K are called

Select the correct option

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-  
- vectors 
- scalars  (Module 36, Pg.44)
- functions 

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Question # 2 of 10

SOLVED BY: **WAQAR HUSSAIN**

$$\|x + y\|$$

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Select the correct option

- | | | | |
|----------------------------------|----------------------|--------------------|--|
| <input checked="" type="radio"/> | $\leq \ x\ + \ y\ $ | (Module 40, Pg.50) | |
| <input type="radio"/> | $\geq \ x\ + \ y\ $ | | |
| <input type="radio"/> | $= \ x\ + \ y\ $ | | |
| <input type="radio"/> | $\leq 2\ x\ $ | | |

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Question # 1 of 10

SOLVED BY: **WAQAR HUSSAIN**

An element x of an inner product space X is said to be orthogonal to an element $y \in X$ if $\langle x, y \rangle = 0$

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

- | | | |
|----------------------------------|----------------------------|---------------------|
| <input type="radio"/> | $\langle x, y \rangle < 0$ | |
| <input checked="" type="radio"/> | $\langle x, y \rangle = 0$ | (Conceptual) |
| <input type="radio"/> | $\langle x, y \rangle > 0$ | |
| <input type="radio"/> | none of these | |

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Question # 10 of 10

SOLVED BY: **WAQAR HUSSAIN**

Norm $\|x\|$ is the distance from x to



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Select the correct option

- | | | |
|----------------------------------|--------------------|---|
| <input type="radio"/> | an arbitrary point |  |
| <input type="radio"/> | 1 |  |
| <input checked="" type="radio"/> | 0 |  |
| <input type="radio"/> | x itself |  |

(Module 40, Pg.50)

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Question # 9 of 10


SOLVED BY: **WAQAR HUSSAIN**

An element x of an inner product space X is said to be _____ to an element $y \in X$ if $\langle x, y \rangle = 0$

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

- | | | | |
|----------------------------------|-------------|--------------|--|
| <input checked="" type="radio"/> | orthogonal | (Conceptual) | |
| <input type="radio"/> | equal | | |
| <input type="radio"/> | orthonormal | | |
| <input type="radio"/> | parallel | | |

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Question # 8 of 10

SOLVED BY: **WAQAR HUSSAIN**

Every normed space is a



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Select the correct option

- | | | |
|----------------------------------|--|--|
| <input type="radio"/> | Banach space | |
| <input type="radio"/> | Metric space | |
| <input type="radio"/> | Null space | |
| <input checked="" type="radio"/> | Vector space with a metric defined by norm | |

(Module 48, Pg.61)

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Question # 7 of 10

SOLVED BY: WAQAR HUSSAIN

Integration operator from $C[a, b]$ into itself is

Select the correct option

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- | | | |
|----------------------------------|------------------------|---|
| <input type="radio"/> | non linear operator |  |
| <input checked="" type="radio"/> | linear operator |  |
| <input type="radio"/> | discontinuous operator |  |
| <input type="radio"/> | Zero operator |  |

(Module 55, Pg.71)

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Question # 6 of 10

SOLVED BY: **WAQAR HUSSAIN**

Euclidean space is



Select the correct option

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vector space



banach space



space of all types mentioned

(Module 41, Pg.52 Conceptual)



Normed space



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Question # 5 of 10

SOLVED BY: **WAQAR HUSSAIN**

Space l^p is

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**



Complete vector space



Null space



Banach space

(Module 40, Pg.51)



Incomplete normed space



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Question # 4 of 10

SOLVED BY: **WAQAR HUSSAIN**

Vector space $X = \{0\}$ has

Select the correct option

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no proper subspace

(Module 39, Pg.49)



proper subspace



infinite dimensional



none of the given options



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Question # 3 of 10

SOLVED BY: **WAQAR HUSSAIN**

$L^2[a, b]$ is

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

- | | | |
|----------------------------------|----------------|---|
| <input type="radio"/> | Normed space |  |
| <input type="radio"/> | Complete space |  |
| <input checked="" type="radio"/> | Banach space |  |
| <input type="radio"/> | Null space |  |





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Question # 2 of 10

SOLVED BY: **WAQAR HUSSAIN**

Every subspace vector space $X(\neq \{0\})$ is called

Select the correct option

PRESENTED BY: TALEEMI MARKAZ

- | | | |
|----------------------------------|-------------------|--------------------|
| <input type="radio"/> | special subspace | |
| <input checked="" type="radio"/> | proper | (Module 38, Pg.47) |
| <input type="radio"/> | zero vector space | |
| <input type="radio"/> | improper | |

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Question # 1 of 10

SOLVED BY: **WAQAR HUSSAIN**

The metric space defined on \mathbb{Q} the set of rational numbers with usual metric.

Select the correct option

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- | | | |
|----------------------------------|--------------------------------|--------------------|
| <input type="radio"/> | is complete | |
| <input type="radio"/> | has only positive integers | |
| <input checked="" type="radio"/> | is incomplete | (Module 27, Pg.33) |
| <input type="radio"/> | has convergent Cauchy sequence | |

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Question # 10 of 10

SOLVED BY: WAQAR HUSSAIN

Let $(V, \langle \cdot, \cdot \rangle)$ be an inner product space over a field F , then _____
& $\forall x, y, z \in V, \alpha, \beta \in F$

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Select the correct option



$$\langle \alpha x + \beta y, z \rangle = \alpha \langle x, z \rangle - \beta \langle y, z \rangle$$



$$\langle \alpha x + \beta y, z \rangle = \alpha \langle x, z \rangle / \beta \langle y, z \rangle$$



$$\langle \alpha x + \beta y, z \rangle = \alpha \langle x, z \rangle * \beta \langle y, z \rangle$$



$$\langle \alpha x + \beta y, z \rangle = \alpha \langle x, z \rangle + \beta \langle y, z \rangle$$

(Module 83, Pg.19)



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Question # 9 of 10

SOLVED BY: **WAQAR HUSSAIN**

For an inner product space $\|x + y\|^2 + \|x - y\|^2 =$

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Select the correct option

- | | | |
|----------------------------------|------------------------|--------------------|
| <input type="radio"/> | $\ x\ ^2 - \ y\ ^2$ | |
| <input checked="" type="radio"/> | $2(\ x\ ^2 + \ y\ ^2)$ | (Module 87, Pg.21) |
| <input type="radio"/> | $\ x\ ^2 + \ y\ ^2$ | |
| <input type="radio"/> | $\ x\ ^2 \ y\ ^2$ | |

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Question # 8 of 10

SOLVED BY: **WAQAR HUSSAIN**

A subset M of a metric space X is called a bounded set if its _____ is finite.

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Select the correct option

- | | | |
|----------------------------------|----------|--------------------|
| <input type="radio"/> | radius | |
| <input checked="" type="radio"/> | diameter | (Module 23, Pg.29) |
| <input type="radio"/> | chord | |
| <input type="radio"/> | sector | |

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Question # 7 of 10

SOLVED BY: **WAQAR HUSSAIN**

The set of all limit points of a set A is called _____ of A.

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Select the correct option

- | | | |
|----------------------------------|-------------|--------------------|
| <input type="radio"/> | Derived Set | |
| <input checked="" type="radio"/> | Closure | (Module 28, Pg.37) |
| <input type="radio"/> | Subset | |
| <input type="radio"/> | Superset | |

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Question # 6 of 10

SOLVED BY: **WAQAR HUSSAIN**

A _____ sequence in a metric space is Cauchy Sequence.

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

- | | | | |
|----------------------------------|-------------|--------------------|--|
| <input checked="" type="radio"/> | Convergent | (Module 27, Pg.36) | |
| <input type="radio"/> | Bounded | | |
| <input type="radio"/> | Divergent | | |
| <input type="radio"/> | Subsequence | | |

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Question # 5 of 10

SOLVED BY: **WAQAR HUSSAIN**

A metric space is a

Select the correct option

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- | | | | |
|----------------------------------|-----------------------|--------------------|--|
| <input checked="" type="radio"/> | Topological space | (Module 16, Pg.21) | |
| <input type="radio"/> | Not topological space | | |
| <input type="radio"/> | incomplete space | | |
| <input type="radio"/> | complete | | |

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Question # 4 of 10

SOLVED BY: **WAQAR HUSSAIN**

If τ is topology on non-empty set X , then intersection of member of belong to τ .

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Select the correct option

- | | | |
|----------------------------------|---------------|--|
| <input type="radio"/> | infinite | |
| <input checked="" type="radio"/> | finite | |
| <input type="radio"/> | arbitrary | |
| <input type="radio"/> | none of these | |

(Module 16, Pg.20)

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Question # 3 of 10





SOLVED BY: WAQAR HUSSAIN

The following expression represents _____ inequality

$$\frac{|x - z|}{1 + |x - z|} \leq \frac{|x - y|}{1 + |x - y|} + \frac{|y - z|}{1 + |y - z|}$$

Select the correct option

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- | | | |
|----------------------------------|------------------------|---|
| <input type="radio"/> | Rectangle inequality |  |
| <input type="radio"/> | Holder's inequality |  |
| <input checked="" type="radio"/> | Triangle inequality |  |
| <input type="radio"/> | Minkowski's inequality |  |

(Module 40, Pg.17)

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Question # 2 of 10

SOLVED BY: **WAQAR HUSSAIN**

The inverse image of _____ set under a continuous mapping is open.

Select the correct option

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- | | | | |
|----------------------------------|-----------|--------------------|--|
| <input checked="" type="radio"/> | an open | (Module 18, Pg.22) | |
| <input type="radio"/> | a closed | | |
| <input type="radio"/> | finite | | |
| <input type="radio"/> | semi open | | |

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Question # 1 of 10

SOLVED BY: **WAQAR HUSSAIN**

Which of the following set has no limit points in \mathbb{R} ?

Select the correct option

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- | | | |
|----------------------------------|-------------------------------|--|
| <input type="radio"/> | The set of rational numbers | |
| <input type="radio"/> | The set of irrational numbers | |
| <input type="radio"/> | The set of complex numbers | |
| <input checked="" type="radio"/> | The set of integers | |

(Module 19, Pg.24)

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SOLVED BY: **WAQAR HUSSAIN**

$C[a, b]$ shows the space of all _____ defined on $[a, b]$

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Select the correct option

- | | | |
|----------------------------------|--------------------------|---|
| <input type="radio"/> | Complex valued functions |  |
| <input checked="" type="radio"/> | Continuous functions |  |
| <input type="radio"/> | Bounded functions |  |
| <input type="radio"/> | Convergent sequences |  |

(Module 41, Pg.52)

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Question # 9 of 10

SOLVED BY: **WAQAR HUSSAIN**

Complete inner product space is called a _____

Select the correct option

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- | | | |
|----------------------------------|---------------|--|
| <input type="radio"/> | Metric space | |
| <input type="radio"/> | Norm space | |
| <input checked="" type="radio"/> | Hilbert space | |
| <input type="radio"/> | Norm space | |

(Module 83, Pg.18)

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Question # 8 of 10

SOLVED BY: **WAQAR HUSSAIN**

Let (\mathbb{R}, d) be a usual metric space and $\mathbb{R} - \mathbb{Q} \subseteq \mathbb{R}$, then which of the following is correct option?

Select the correct option

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- | | | |
|----------------------------------|--|--------------|
| <input type="radio"/> | The set of limit points of $\mathbb{R} - \mathbb{Q}$ is closed | |
| <input checked="" type="radio"/> | The set of limit points of $\mathbb{R} - \mathbb{Q}$ is an empty set | (Conceptual) |
| <input type="radio"/> | The set of limit points of $\mathbb{R} - \mathbb{Q}$ is open | |
| <input type="radio"/> | None of them | |

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Question # 7 of 10

SOLVED BY: **WAQAR HUSSAIN**

Complete norm space is called a _____.

Select the correct option

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- | | | |
|----------------------------------|---------------------|--|
| <input type="radio"/> | metric space | |
| <input type="radio"/> | hilbert space | |
| <input type="radio"/> | inner product space | |
| <input checked="" type="radio"/> | banach space | |

(Module 40, Pg.51)

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Question # 6 of 10

SOLVED BY: **WAQAR HUSSAIN**

In a discrete metric space X , every subset is

Select the correct option

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- | | | |
|----------------------------------|--|--|
| <input type="radio"/> | countable |  |
| <input checked="" type="radio"/> | open and closed | (Conceptual)  |
| <input type="radio"/> | open |  |
| <input type="radio"/> |  |  |

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Question # 5 of 10

SOLVED BY: **WAQAR HUSSAIN**

$\|z - x\|^2 + \|z - y\|^2 = \frac{1}{2} \|x - y\|^2 + 2 \left\| z - \frac{1}{2}(x + y) \right\|^2$ is called _____.

Select the correct option

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- | | | |
|----------------------------------|------------------------|--|
| <input type="radio"/> | Pythagorean theorem | |
| <input type="radio"/> | Polarization identity | |
| <input type="radio"/> | Parallelogram equality | |
| <input checked="" type="radio"/> | Apollonius identity | |

(Module 87, Pg.21)

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Question # 4 of 10

SOLVED BY: **WAQAR HUSSAIN**

In, $\emptyset \neq A \subset (X, d)$, a point x is a limit point of A , if _____ points of A other than x .

Select the correct option

PRESENTED BY: **TALEEMI MARKAZ**

- | | | | |
|----------------------------------|---|--------------|--|
| <input checked="" type="radio"/> | every open sphere at x , contains some | (Conceptual) | |
| <input type="radio"/> | there is an open sphere at x which contains all | | |
| <input type="radio"/> | | | |
| <input type="radio"/> | | | |

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Question # 3 of 10


SOLVED BY: **WAQAR HUSSAIN**

Represents the _____ for a non-empty subset A of (X,d)

$$\delta(A) = \text{Sup}_{x,y \in A} d(x,y)$$

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Select the correct option

- | | | |
|----------------------------------|----------|---|
| <input type="radio"/> | norm |  |
| <input checked="" type="radio"/> | Diameter | (Lecture 23, Pg.26)  |
| <input type="radio"/> | Distance |  |
| <input type="radio"/> | Meric |  |

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SOLVED BY: **WAQAR HUSSAIN**

$d(x, y) = |x - y|$ is a usual metric defined on

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Select the correct option

- | | | |
|----------------------------------|-------|--------------------|
| <input type="radio"/> | R | |
| <input checked="" type="radio"/> | R | (Module 21, Pg.23) |
| <input type="radio"/> | R^n | |
| <input type="radio"/> | R^3 | |

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Question # 1 of 10

SOLVED BY: **WAQAR HUSSAIN**

0 and 1 are the limit points of _____ $\subset (\mathbb{R}, d)$.

Select the correct option

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- | | | |
|----------------------------------|----------------------------|--------------------|
| <input type="radio"/> | [0,1] | |
| <input type="radio"/> |]0,1] | |
| <input checked="" type="radio"/> | (0,1) | (Module 19, Pg.21) |
| <input type="radio"/> | All other choices are true | |

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