YOUTUBE CHANNEL: S KHAN ACADEMY

MTH634 QUIZ FILE

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Quiz No.1

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Which of the following is true?

In geometry we care about measurements but in topology we don't care about exact measurements

In a discrete space X, the derived set A' of any subset A of X is _____

Empty set

If X finite and has n elements then power set of X has _____ elements

2n

A subset U of R2 is open in R2 iff it contains an ---- at each of its points

Open disk

Which of the following statement is not true?

Indiscrete topology is finer than any other topology defined on the same non empty set

Let X = {a, b, c, d, e} the following set is a topology on Z.

{ϕ, {a},{a, b},{a, c, d},{a, b, c, d},{a, b, e}, X}

The largest topology defined on some set is the_____

Discrete

Only one topology can be defined on a set.

False

$\bigcap_{n\in N}\left(-\frac{1}{n},\frac{1}{n}\right)$=……, where N stand for set of natural numbers.

{0}

Let X = {a, b, c, d} the following set is a topology on X.

{ϕ, {c, d},{b, c, d},X}

Which of the following topology contains the complete power set of set?

Discrete topology

Let X = R with usual topology and A = (0, 3) then limit point of A is:

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1.5

Every open subset of the real line is the union of disjoint------

Open intervals

For an open ball centered at x = {x1, x2, ------, xn} belongs to the Rn which of the following is the correct representation?

$\{y|\sqrt{\sum_{i=1}^{n}(xi-yi)^2} < r\} \subset R^n$, where y = {y1, y2, ……., yn}ϵR^n

Let X be the nonempty set and T be the topology on X, then the following statements must be true. (Where P(X) denote the power set of X)

t⊂P(X)

Finite complement topology define on a set "A" consist of those subsets "U" of "A" such that either Uc is finite or _____

U =A

The trivial topology is also called:

Indiscrete topology

In a topological space the intersection of any collection of closed set is ----

Open

A subset A of topological space X is close if and only if -----

A'⊂ A

Which of the following are not topologically equal?

A circle and a line

If some shape can be deformed in another shape then topologically, they are considered to be

The same

If X = R with usual topology and consider B = {1/n where n belongs to the set of natural numbers}, then the limit points of B is-----

0

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If in a topology t on X, all subsets of X are called open and closed, then t is called:

Discrete space

Let X = {a, b, c, d} then the following set is the topology on X.

{ϕ, {b, d}, {a, b, c}, {b}, X}

The smallest topology one can define on same set is called:

Indiscrete topology

Let X = {a, b, c, d} then the following set represents a topology on X.

{ϕ, {a}, {a, b}, X}

Let X = {a, b, c, d} and t = {ϕ, {c}, {a, c}, {b, c, d}, X}be a topology on X. then closed set in X is:

{b, d}

Let X = {1, 2, 3} the P(X) = _____

{ϕ, {1}, {2}, {3}, {1, 2}, {1, 3}, {2, 3}, X}

Which of the following represents an open interval on real line R?

{x|a<x<b} where a, b ∈ $Rwith\ usual\ order\ a < b$

Every collection of subsets of a set is said to be topology.

False

Let X= R with usual topology and consider B = {1, 1/2, 1/3, 1/4, …….}. then limit point of B is:

0

Topology means the study of something with respect to its ……

Place

Which of the following statement is true?

For A, B subsets of the topological space X, if A⊂B then A'⊂B'

If X is a finite set then co-finite topology on X is:

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Discrete topology

For any two topologies T1 and T2 define on a non empty set then T1 is finer than T2, iff for all U (open set)$\epsilon T2$ implies……

$U \in T1$

The set of …… of R (Real line) forms a topology called usual topology.

All open intervals

Let T1 and T2 be the two topologies on a non-empty set X. then T2 is finer than T1 iff……

$T1 \subseteq T2$

For a function f: X→Y, the restriction of f to A where A is a subset of X is continuous if f: X→Y is…

continuous

Let = R with usual topology and A = {0, 4) then the limit point of A is:

2

A function is continuous if and only if the inverse image of every……Subset of Y under f is…in X.

Closed, closed

In a topological space, a subset of A of X closed if the compliment of A in X is open.

True

Boundary point of a set is also called……point

Frontier

The set of all open intervals of R is a topology on R, called

Usual topology

Let X = {a, b, c, d}. The following sets represents a topology on X

{ϕ, X}

Derived set of empty set....

Empty

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K-Topology on the real line is not finer than the usual topology.

False

A function whose range is a singleton is called a…. function.

constant

Which of the following is true for a subset A of a Topological space X.?

$X = A^0 \cup ext(A) \cup bd(A)$

Union of topologies on a set X is:

May or may not be a topology

Which of the following is the topology on real line induced by the set of all linear functions from R to R with lower limit topology is…?

Discrete

Let (X, t) be the topological space and A, B ⊂ X If A ⊂ B then:

$\overline{A} \subset \overline{B}$

A proper closed subset of a topological space X can never dense in X.

true

Let = {a, b, c. d, e} with topology T= {o. {b}. {a, d}, {a, b, d). {a, e, d, e}.x). The interior point of A = {a, b, e} is:

b

A map f from a topological space X to a topological space Y is an open map if and only if the image of…

each open subset of domain space is open in range space

Subset A of a topological space (X, T) is…. iff $\overline{A} = A$.

Closed

The set of all open disks forms a usual basis for the usual topology defined on ……

R2(Real plane)

A function f: X→Y from a topological space (X, Tx) to a topological space (Y, Ty) is continuous iff for all $U \in Ty$, there exist $V \in Tx$. such that

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f-1(u)=v

In a topological space, a subset of A of x closed if the compliment of A in X is open.

True

If T is a topology on a nonempty set X, then arbitrary……. Of members of T belongs to T.

Intersection

Exterior point of a set is the ……. point of its complement.

Interior

(T1 Union T2) is the smallest topology containing……

Both T1 and T2

Which of the following topology is called "Finite Complement Topology"?

Co-finite topology

Let (X. t) be the topological space and A. B⊂X such that A⊂B then for derived set A' and

$(A \cup B)' = A' \cup B'$

….. of a subset A of a topological space (X, T) is the set of all limit points of A.

Derived set

Which of the following is the smallest closed super set of a subset A of a topological space X?

closure of a set A

If f(x)=x+2, then f-1(a)=...

a-2

let $\{T_i | i \in I\}$ be any collection of topologies on set X, then $\cap_{i \in I} T_i$ is:

a topology

Which of the following is the basis for a K-Topology defined on real line where K is a subset of R?

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$B_k = \{(a,b)|a,b \in R\} \cup \{(a,b)\backslash k|a,b \epsilon R\}$

Continuity of a function in a topological space depends on the collection of …… of both sets

open sets

If B is a basis for a topology T on a set X then……element of T can be written as union of the elements of B.

Every

If X has 4 elements then power set of X has ……..elements

16

Which of the following is the basis for a lower limit topology on R (The Set of Real Numbers)?

$B_1 = \{[a,b)|a,b \in R\}$

Which of the following statement is correct?

The composition of two continuous function is a continuous function.

Interior of a set A (denoted by A^o) which is a subset of a topological space X is the ...of all.... subsets of X contained in A.

union, open

Closure of A is the smallest closed superset of A.

True

$\overline{\overline{(A)}}$ =?

A

Let = R with usual topology and B = [1,2). Tlhen interior ofa set B is

3/2

Let A be the collection of all closed subset of a topological space (X, t) then A is closed under ……set union

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Finite

For a function f: X→Y, the restriction of f to A where A isa subset of X is a function fA:A→Y defined as.

fA(a)=f(a) for all a belongs to A.

A map f from a topological space X to a topological space Y is... if and only if the image of each element of a basis for Tx (Topology on X) is open subset of Y.

an open map

if B is a basis for a topology T on a set X then every element of T can be written as .... of the elements of B.

Union

Quiz No.2

A homomorphic map between two topological spaces is always…..

Bijective

Let X and Y be topological spaces and f:X→Y be bijection then which of the following statement is not true?

F is discontinuous and open

Let X and Y be topological spaces and f:X→Y be bijection then f is said to be homomorphism if _____

F and its inverse must be continuous

Let X = Q (set of rational number) be usual metric space and Q⊆R, then which of the following statement is true about Q?

All of them

The property d(x, y)>0 of the metric space is called….

Non negative

Let x = {1, 2, 3, 4, 5} and t = {ϕ, {1}, {2}, {1, 2}, X} be the topology on X then which of the following is true?

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All of them

Let X = R (set of real number) be usual metric space and N⊆R, then which of the following statement is not true about N?

Neither of its point is interior point

Let X = R (set of real number) be usual metric space and N⊆R, then which of the following statement is true about N?

All of them

Let X and Y be topological spaces, A function f:X→Y is continuous if ….

The preimage of every open set is open

If d is the usual metric space on R, then d(2, 8) =

$$2 + \int_0^2 2x dx$$

If two sets A and B have same cardinality then which of the following is not true?

f:A→B is not an invertible function

Let x = {1, 2, 3, 4, 5, 6} and t = {ϕ, {1}, {2}, {1, 2}, X} be the topology on X, then the local base (Bx)of the point x =2 is ……

{{2}, {1, 2}, X}

Let (X, t) be the metrizable then which of the following statement is true?

All of them

Let X = {a, b, c} and t = {ϕ, {a}, {b}, {a, b}, X} be a topology on X, if B = {ϕ, {a}, {b}, X} be the base of t then which of the following is true?

All of them

Let x = {1, 2, 3, 4, 5,6} and t = {ϕ, {3}, {4}, {3, 4}, X} be the topology on X then which of the following is true?

All of them

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Let x = {1, 2, 3, 4} and t = {ϕ, {1}, {2}, {1, 2}, X} be the topology on X, then which of the following is not true?

The local base of the element 4 is ϕ

If (X, d) is compact metric space, then …..

Every sequence which has a convergent subsequence is a Cauchy sequence

Metric space introduced by d(x, y) = |x-y| on R is called….

Usual topology

Every topological space is a first countable space.

True

The usual metric d(x, y) = |x-y| defined on…..

R

Let X = {a, b, c} and t = {ϕ, {a}, {b}, {a, b}, X} be a topology on X, if B = {ϕ, {a}, {b}, X} be the base of t then which of the following is not true?

(X, t) be the second countable space

Let (M, d) be a metric space then for all $a \in M$ and for all r>0, B(a, r)….

Must be an open ball

Let X and Y be topological spaces, A map f:X→Y is called a closed map if….

For every closed set U⊆X, the image f(U)⊆Y is closed

For a metric space (X, d) for all x, y belongs to X d(x, y) = d(y, x) is called….property

Symmetric

Homomorphism of topological spaces is an equivalent relation

True

Metric topology introduced by $d(x,y) = \begin{cases} 0 \ if \ x = y \\ 1 \ if \ x \neq y \end{cases}$ is called..

Discrete topology

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Let x = {1, 2, 3, 4, 5, 6} and t = {ϕ, {1}, {2}, {1, 2}, X} be the topology on X, then the local base (Bx)of the point x =3, 4, 5 is

{X}

Which of the following statement is not correct?

Boundedness is a topological property

Two spaces are called topological equivalent if there exists a …… between two topological spaces

Homomorphism

Let x = {1, 2, 3, 4, 5, 6} and t = {ϕ, {1}, {2}, {1, 2}, X} be the topology on X, then the local base (Bx)of the point x = 1 is

{{1}, {1, 2}, X}

A homomorphic map between two topological spaces is always….

continuous

Quiz No.3

Image of a compact space under a continuous map is compact.

True

R with usual topology is a T4-space.

True

Let X= {1,2,3,4} and T = {0, {1}, {2}, {1,2}, X be a topology an X, then which of the following is true

All of the given option

Every compact subspace of a Hausdorff space is not closed.

False

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Every Topological Space is a first countable space.

True

Which of the following statement is false?

Every metric space is second countable space

Every compact subspace of a Hausdorff space is not closed.

False

Every discrete space is not a regular space

False

Consider R with usual topology There exists no homomorphism between an open interval of R and a close interval of R

True

Which of the following statement is true?

R with indiscrete topology is compact

Consider R with usual topology. Then A = {0,1) ∪ (3,5] is disconnected subset of R,

True

image of a compact space under a continuous map is compact.

True

A Set X with co finite topology is compact

True

All the metric spaces are not normal spaces

False

if (X, t) be a compact hausdorff space then (X, t) is not normal.

True

Let X = {1, 2, 3, 4, 5, 6} and t = {Φ,{3}, {4}, {3, 4}, X} be topology on X. then which of the following is true?

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All of them

Let X = {1, 2, 3, 4, 5} and t ={ϕ, {1, 2}, {3, 4}, X}be the topology on X, and A= {2, 3} is a dense set, then which is true?

(X, t) must be a separable topology

All the metric space does not normal space

False

Every discrete space is not a regular space'

True

Consider R with usual topology, which are the following sets are separated?

A =(0, 1), B = (4, 5]

A topological space X is called a connected space iff there exists a pair of subsets of X both nonempty and both open and close

True

Final Term Mcqs

which of the following statement is true?

All spaces are not metrizable

Let f:R→R be the function define as f(x) = x + 1 fixed point of f is:

No fixed point

A topological space is a T1-space if and only if its each finite subset is:

A closed set

Every second countable space is not a lindelof space.

False

Which of the following statement is false?

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With discrete topology is separable

Every subspace of T3-space is a:

T3-space

Every compact subspace of hausdorff space is open.

False

Which of the following statement is true?

Projection may or may not be closed

.. with usual topology is a T4-space.

True

Every subspace of second countable space is second countable.

True

Which of the following statement is false?

A nonempty set $X \neq \{x\}$ with indiscrete topology is hausdorff

A map f(X, Tx)→(Y, Ty) such that (1) f is bijective (2) f is continuous (3) f is an open map then the map f is called:

Homomorphism

For metric d on X, an open ball of radius r with center $x \in X$ is defined as:

$B(x,r) = \{y \in X | d(x,y) < r\}$

Which of the following statement is true?

Every T1-space is T0

A map f: (X, Tx)→(Y, Ty) is an open map iff.

The image of each element of a base Bx of Tx is an open subset of Y

A discrete space is not locally connected.

False

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A set X with co-finite topology is compact.

True

Let C be a connected component of a topological space X, then

C is closed

A nonempty set $X \neq \{x\}$ with indiscrete topology is a?

None

Let $B_1(x, r_1)$ and $B_2(x, r_2)$ be two open balls centered at x with radii r1 and r2 respectively. Then the following statement is true?

Either $B_1(x, r_1) \subset B_2(x, r_2)$ or $B_1(x, r_1) \supset B_2(x, r_2)$

The image of connected topological space is path connected.

True

Closure of connected subset is also connected.

True

Which of the following statement is false?

Indiscrete topology on a set X containing more than one point is metrizable

Which of the following statement is true?

Every second countable space is separable

A finite set has …. In a T1-space

No limit points

Which of the following statement is true?

If a map f :X→Y is bicontinuos then it may or may not be bijective

Which of the following statement is true?

A separable metric space is second countable

Which of the following statement is false?

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Discrete topology on a real line R is second countable

If (X, t) be a path connect topological space, then (X, t) is connected.

True

A regular T1-space is called a?

T3-space

A real line R with usual topology is path connected.

True

A discrete space is not locally connected.

False

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