MTH631:Quiz-2

Quiz Start Time: 09:59 AM, 18 February 2021

Question # 5 of 10 (Start time: 09:59:29 AM, 18 February 2021)

Total Marks: 1

A compact set in $\mathbb{R}^n$ is - - - - - - - - - - .

Select the correct option

Reload Math Equations

○	open and unbounded
○	open and bounded
○	closed and unbounded
○	closed and bounded

MTH631:Quiz-2

Quiz Start Time: 09:59 AM, 18 February 2021

Question # 7 of 10 (Start time: 10:00:13 AM, 18 February 2021)

Total Marks: 1

In $\mathbb{R}^n$, an open n - ball of radius r about X_0 is $B_r(X_0) = \{X : |X - X_0| < r\}$, then its closure is - - - - - - - .

Select the correct option

Reload Math Equations

- $\{X : |X - X_0| = r\}$
- $\{X : |X - X_0| \leqslant r\}$
- $\{X : |X - X_0| \geqslant r\}$
- $\{X : |X - X_0| > r\}$

MTH631:Quiz-2

Quiz Start Time: 09:59 AM, 18 February 2021

Question # 10 of 10 (Start time: 10:01:14 AM, 18 February 2021)

Total Marks: 1

In $\mathbb{R}^2$, the set $\left\{(x,y) : \left(x^2+y^2 \leqslant a\right) \vee \left(x^2+y^2 \geqslant b\right), a < b\right\}$ is a region.

Select the correct option

Reload Math Equations

- ○ True
- ● False

MTH631:Quiz-2

Quiz Start Time: 09:59 AM, 18 February 2021

Question # 9 of 10 (Start time: 10:00:44 AM, 18 February 2021)

Total Marks: 1

If $\mathbb{R}^n$ is connected, such that $\mathbb{R}^n = A \cup B$ with $\bar{A} \cap B = A \cap \bar{B} = \phi$, then - - - - - .

Select the correct option

Reload Math Equations

- $\bar{A} \subset A, \bar{B} \subset B$
- A and B are both open and closed
- Either $A = \mathbb{R}^n, B = \phi$ or $B = \mathbb{R}^n, A = \phi$
- All above can be concluded

MTH631:Quiz-2

Question # 6 of 10 (Start time: 09:56:07 AM, 18 February 2021)

If $\lim_{X \to X_0} f(X)$ exists, then it is _____.

Select the correct option

○	1
◉	unique
○	0
○	none of these

MTH631:Quiz-2

Question # 3 of 10 (Start time: 09:54:16 AM, 18 February 2021)

Sequence in $\mathbb{R}^2$ defined as;

$\{X_r\} = \left\{\left(\frac{\cos r}{r}, \frac{\sin r}{r}\right)\right\}$ converges to - - - - - .

Select the correct option

	$(1, 0)$
	$(0, 1)$
	$(0, 0)$
	$(1, 1)$

Question # 8 of 10 (Start time: 09:56:56 AM, 18 February 2021)

An open disc: $\{(x, y) : x^2 + y^2 < 1\}$ in $\mathbb{R}^2$ is - - - - - - .

Select the correct option

- [x] diconnected
- [ ] disconnected polygonally
- [ ] connected polygonally
- [ ] none of these.

Question # 10 of 10 (Start time: 09:57:27 AM, 18 February 2021)

In $\mathbb{R}^n$, if the line segment: $X = tX_2 + (1-t)X_1$, $0 < t < 1$, joining X_1 and X_2 lies in $S_\varepsilon(X_0)$, *then* – – – –.

Select the correct option

- [x] $|X - X_0| < \varepsilon$
- [ ] $|X - X_0| < 1 - \varepsilon$
- [ ] $|X - X_0| < t$
- [ ] $|X - X_0| < 1 - t$

Question # 4 of 10 (Start time: 09:54:46 AM, 18 February 2021)

Set of isolated point(s) of the complement of set $\{(x,y) : -n < x, y < n, (x,y) \neq (0,0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, is $-----$.

Select the correct option

- $\{(x,y) \in \mathbb{R}^2 : x = y = |n|, n \in \mathbb{N}\} \cup \{(0,0)\}$
- $\{(0,0)\}$
- $\{(x,y) \in \mathbb{R}^2 : x = y = |n|, n \in \mathbb{N}\} \cap \{(0,0)\}$
- $\{(x,y) \in \mathbb{R}^2 : x = y = |n|, n \in \mathbb{N}\}$

Question # 2 of 10 (Start time: 09:53:49 AM, 18 February 2021)

In $\mathbb{R}^3$, the lines $L_1 : X = (2, -1, 5) + \alpha(2, -1, 3)$ and $L_2 : X = (2, -1, 5) + \beta\left(-5, \frac{5}{2}, -\frac{15}{2}\right)$ are traversed in - - - - - - - - - directions, where $-\infty < \alpha, \beta < \infty$.

Select the correct option

- [x] same
- [ ] opposite
- [ ] perpendicular
- [ ] oblique

Question # 5 of 10 (Start time: 09:55:47 AM, 18 February 2021)

The function $f(x, y) = \frac{xy}{x^2+y^2}$ is defined everywhere in _____ except at _____.

Select the correct option

○	$R^2,\ (1, -1)$
○	$R^3,\ (1, -1, 0)$
◉	$R^2,\ (0, 0)$
○	none of these

MTH631:Quiz-2

Question # 7 of 10 (Start time: 09:56:28 AM, 18 February 2021)

If $\phi \neq S \subseteq \mathbb{R}^n$, then the set S is bounded if - - - - - - - .

Select the correct option

- $\sup\{|X-Y| : X, Y \in S\} = \infty$
- $\sup\{|X-Y| : X, Y \in S\} < \infty$
- $\inf\{|X-Y| : X, Y \in S\} = \infty$
- $\inf\{|X-Y| : X, Y \in S\} < \infty$

Question # 9 of 10 (Start time: 09:57:13 AM, 18 February 2021)

The space R^n is _____.

Select the correct option

- (●) connected
- ( ) not connected
- ( ) both a and b
- ( ) none of these

Question # 1 of 10 (Start time: 09:53:22 AM, 18 February 2021)

For a non empty closed and bounded subset S in $\mathbb{R}^n$, if H is the collection open sets such that $S \subset \cup\{H : H \in \mathrm{H}\}$, then by Heine - Borel theorem,

Select the correct option

○	$S \subset \bigcup_{\lambda \in \Lambda} \{H_\lambda : H_\lambda \in \mathrm{H}\}$
○	$S \subset \bigcup_{\alpha=1}^{\infty} \{H_\alpha : H_\alpha \in \mathrm{H}\}$
○	$S \subset \bigcup_{\alpha=1}^{n} \{H_\alpha : H_\alpha \in \mathrm{H}\}$
●	All above are equally valid

MTH631:Quiz-2

Quiz Start Time: 09:40 AM, 18 February 2021

Question # 7 of 10 (Start time: 09:44:01 AM, 18 February 2021)

Total Marks: 1

Limit points of set $S = \{(x, y) : -n < x, y < n, (x, y) \neq (0, 0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, - - - -.

Select the correct option

Reload Math Equations

- $\{(0, 0)\} \cup \{(x, y) : x, y = \pm n, n \in \mathbb{N}\}$
- $\{(0, 0)\} \cup S$
- $\{(0, 0)\} \cup \{(x, y) : x, y = \pm n, n \in \mathbb{N}\} \cup S$
- $\{(x, y) : x, y = \pm n, n \in \mathbb{N}\} \cup S$

MTH631:Quiz-2

Quiz Start Time: 09:40 AM, 18 February 2021

Question # 6 of 10 (Start time: 09:43:25 AM, 18 February 2021)

Total Marks: 1

If $\lim_{X \to X_0} f(X)$ exists, then it is _____.

Select the correct option

Reload Math Equations

- 1
- unique
- 0
- none of these

Click to Save Answer & Move to Next Question

Question # 4 of 10 (Start time: 09:42:19 AM, 18 February 2021) Total Marks: 1

Closure of the set $\{(x,y) : -n < x, y < n, (x,y) \neq (0,0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, is $-----$.

Select the correct option

Reload Math Equations

○	$\{(x,y) : -n < x, y < n, n \in \mathbb{N}\}$
○	$\{(x,y) : -n \leqslant x, y \leqslant n, n \in \mathbb{N}\}$
○	$\{(x,y) : (x,y) \neq (0,0)\}$
○	$\{(x,y) : x, y \leqslant n, (x,y) \neq (0,0), n \in \mathbb{N}\}$

Question # 3 of 10 (Start time: 09:41:27 AM, 18 February 2021) Total Marks: 1

Exterior of the set $\{(x,y) : -n < x, y < n, (x,y) \neq (0,0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, is $----$.

Select the correct option

Reload Math Equations

- $\{(x,y) \in \mathbb{R}^2 | \, |x| < n, |y| > n, n \in \mathbb{N}\}$
- $\{(x,y) \in \mathbb{R}^2 | \, |x| > n, |y| < n, n \in \mathbb{N}\}$
- $\{(x,y) \in \mathbb{R}^2 | \, |x| > n, |y| > n, n \in \mathbb{N}\}$ ✓
- $\{(x,y) \in \mathbb{R}^2 | \, |x| < n, |y| < n, n \in \mathbb{N}\}$

Click to Save Answer & Move to Next Question

2021)

In $\mathbb{R}^n$, an open n - ball of radius r about X_0 is $B_r(X_0) = \{X : |X - X_0| < r\}$, which contains - - - - - - - .

an ε - neighborhood of each of its points

limit points of each of its points

only its isolated point at center X_0

limit points of each of its boundary

Question # 2 of 10 (Start time: 09:04:48 AM, 18 February 2021) Total Marks: 1

Limit points of set $S = \{(x, y) : -n < x, y < n, (x, y) \neq (0, 0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, - - - - -.

Select the correct option

Reload Math Equations

○	$\{(0,0)\} \cup \{(x,y) : x, y = \pm n, n \in \mathbb{N}\}$
○	$\{(0,0)\} \cup S$
○	$\{(0,0)\} \cup \{(x,y) : x, y = \pm n, n \in \mathbb{N}\} \cup S$
○	$\{(x,y) : x, y = \pm n, n \in \mathbb{N}\} \cup S$

MTH631:Quiz-2

Quiz Start Time: 09:40 AM, 18 February 2021

Question # 2 of 10 (Start time: 09:40:30 AM, 18 February 2021)

Total Marks: 1

Which of the following non - empty subset on Real line $\mathbb{R}$ is taken as *region* ?

Select the correct option

Reload Math Equations

- ○ Natural numbers $\mathbb{N}$
- ● Intervals (open, closed, semi open or closed)
- ○ Rationals $\mathbb{Q}$ or Irrationals $\mathbb{Q}^c$
- ○ Range of pointwise or uniform real valued convergent sequences

Click to Save Answer & Move to Next Question

MTH631:Quiz-2

Question # 10 of 10 (Start time: 09:43:48 PM, 17 February 2021)

The function $f(x,y) = \frac{xy}{x^2+y^2}$ is defined everywhere in _____ except at _____.

Select the correct option

○	$R^2,\ (1,-1)$
○	$R^3,\ (1,-1,0)$
○	$R^2,\ (0,0)$
○	none of these

In $\mathbb{R}^n$, if the line segment: $X = tX_2 + (1-t)X_1$, $0 < t < 1$, joining X_1 and X_2 lies in $S_\varepsilon(X_0)$, then

correct option

$|X - X_0| < \varepsilon$

$|X - X_0| < 1 - \varepsilon$

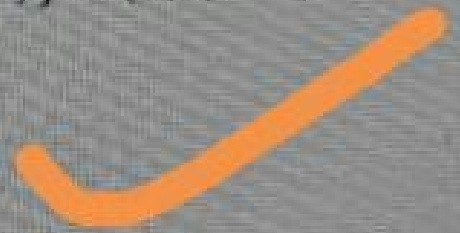
$|X - X_0| < t$

$|X - X_0| < 1 - t$

Intervals $(0,1)$ and $(1,2)$ are example of disconnected sets in $\mathbb{R}$ because - - - - - - - - .

$$(0,1) \cap (1,2) = \phi$$

$\{\text{closure of } (0,1)\} \cap (1,2) = \phi$ and $\{\text{closure of } (1,2)\} \cap (0,1) = \phi$



Click to Save Answer

MTH631:Quiz-2

Question # 7 of 10 (Start time: 09:41:51 PM, 17 February 2021)

Let $f(x,y) = \frac{xy}{x^2+y^2}$ then the limit of f along the line $y = -x$ as (x,y) approach $(0,0)$ is _____.

Select the correct option

○	0
○	undefined
○	$1/2$
○	$-1/2$

MTH631:Quiz-2

Question # 6 of 10 (Start time: 09:41:19 PM, 17 February 2021)

For a non empty closed and bounded subset S in $\mathbb{R}^n$, if H is the collection open sets such $S \subset \cup\{H : H \in \mathrm{H}\}$, then by Heine - Borel theorem,

Select the correct option

○	$S \subset \bigcup_{\lambda \in \Lambda} \{H_\lambda : H_\lambda \in \mathrm{H}\}$
○	$S \subset \bigcup_{\alpha=1}^{\infty} \{H_\alpha : H_\alpha \in \mathrm{H}\}$
○	$S \subset \bigcup_{\alpha=1}^{n} \{H_\alpha : H_\alpha \in \mathrm{H}\}$
○	All above are equally valid

Question # 5 of 10 (Start time: 09:40:39 PM, 17 February 2021)

An open disc: $\{(x, y) : x^2 + y^2 < 1\}$ in $\mathbb{R}^2$ is - - - - - - - .

Select the correct option

○	diconnected
○	disconnected polygonally
○	connected polygonally
○	none of these.

Exterior of the set $\{(x,y) : -n < x, y < n, (x,y) \neq (0,0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, is – – – – –.

correct option

Re

$\{(x,y) \in \mathbb{R}^2 | |x| < n, |y| > n, n \in \mathbb{N}\}$

$\{(x,y) \in \mathbb{R}^2 | |x| > n, |y| < n, n \in \mathbb{N}\}$

$\{(x,y) \in \mathbb{R}^2 | |x| > n, |y| > n, n \in \mathbb{N}\}$

$\{(x,y) \in \mathbb{R}^2 | |x| < n, |y| < n, n \in \mathbb{N}\}$

Question # 3 of 10 (Start time: 09:39:20 PM, 17 February 2021)

A sequence of points $\{X_r\}$ in R^n converges if and only if for each _____ there is an integer K such that _____ if $r, s \geq K$.

Select the correct option

O	$\varepsilon < 0, \quad \lvert X_r - X_s \rvert < \varepsilon$
O	$\varepsilon > 0, \quad \lvert X_r - X_s \rvert > \varepsilon$
O	$\varepsilon > 0, \quad \lvert X_r - X_s \rvert < \varepsilon$
O	$\varepsilon \neq 0, \quad \lvert X_r - X_s \rvert > \varepsilon$

MTH631:Quiz-2

Question # 2 of 10 (Start time: 09:38:28 PM, 17 February 2021)

If $\lim_{X \to X_0} f(X)$ exists, then it is _____.

Select the correct option

- 1
- unique
- 0
- none of these

MTH631:Quiz-2

Question # 1 of 10 (Start time: 09:37:10 PM, 17 February 2021)

A compact set in R^n is - - - - - - - - - - .

Select the correct option

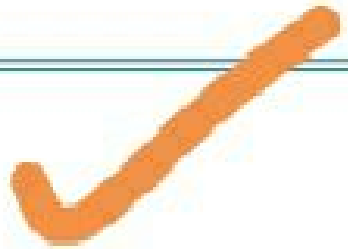
○	open and unbounded
○	open and bounded
○	closed and unbounded
○	closed and bounded

Closure of the set $\{(x,y) : -n < x, y < n, (x,y) \neq (0,0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, is $-----$.

Reload Math Equa

$\{(x,y) : -n < x, y < n, n \in \mathbb{N}\}$

$\{(x,y) : -n \leqslant x, y \leqslant n, n \in \mathbb{N}\}$



$\{(x,y) : (x,y) \neq (0,0)\}$

$\{(x,y) : x, y \leqslant n, (x,y) \neq (0,0), n \in \mathbb{N}\}$

Interior of the set $\{(x,y) : -n < x, y < n, (x,y) \neq (0,0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, is $- - - - -$.

ion

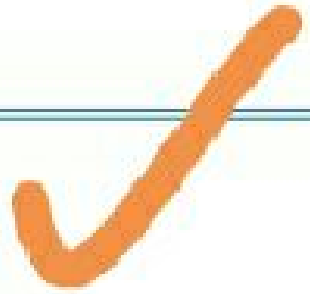
Reload Math Eq

$\{(x,y) \in \mathbb{R}^2 \,|\, |x| < n, |y| > n, n \in \mathbb{N}\}$

$\{(x,y) \in \mathbb{R}^2 \,|\, |x| > n, |y| < n, n \in \mathbb{N}\}$

$\{(x,y) \in \mathbb{R}^2 \,|\, |x| > n, |y| > n, n \in \mathbb{N}\}$

$\{(x,y) \in \mathbb{R}^2 \,|\, |x| < n, |y| < n, n \in \mathbb{N}\}$



Question # 9 of 10 (Start time: 09:31:00 PM, 17 February 2021)

If H is an open covering of a compact subset S, then S can be covered by _____ many sets from H.

Select the correct option

Reloa

○	finitely
○	infinitely
○	both a and b
○	non of these

Set of isolated point(s) of the complement of set $\{(x,y) : -n < x, y < n, (x,y) \neq (0,0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, is – –

ct option

$\{(x,y) \in \mathbb{R}^2 : x = y = |n|, n \in \mathbb{N}\} \cup \{(0,0)\}$

$\{(0,0)\}$

$\{(x,y) \in \mathbb{R}^2 : x = y = |n|, n \in \mathbb{N}\} \cap \{(0,0)\}$

$\{(x,y) \in \mathbb{R}^2 : x = y = |n|, n \in \mathbb{N}\}$

Question # 9 of 10 (Start time: 09:29:43 PM, 17 February 20

The space R^n is _____.

Select the correct option

- connected
- not connected
- both a and b
- none of these

Question # 7 of 10 (Start time: 09:29:19 PM, 17 February 2021) Total Marks

A set " S " is polygonally connected if, ------ pair of points in S can be connected by a polygonal path lying ------- in " S ".

Select the correct option

- some, entirely
- every , entirely
- some, partially
- every, partially

Question # 8 of 10 (Start time: 09:29:10 PM, 17 February 2021)

If $\phi \neq .S \subseteq \mathbb{R}^n$, then the set S is bounded if - - - - - - - - .

Select the correct option

○	$\sup\{\|X-Y\| : X, Y \in S\} = \infty$
○	$\sup\{\|X-Y\| : X, Y \in S\} < \infty$ ✓
○	$\inf\{\|X-Y\| : X, Y \in S\} = \infty$
○	$\inf\{\|X-Y\| : X, Y \in S\} < \infty$

Question # 7 of 10 (Start time: 09:28:21 PM, 17 February 2021)

The function $f(x,y) = \frac{xy}{x^2+y^2}$ is defined everywhere in _____ except at _____.

Select the correct option

Reload Math

- $R^2,\ (1,-1)$
- $R^3,\ (1,-1,0)$
- $R^2,\ (0,0)$
- none of these

10 (Start time: 09:28:33 PM, 17 February 2021) Total Mark

In $\mathbb{R}^n$, which of the following is true about $\phi = \{\}$ and $A = \{(a_1, a_2, \ldots, a_n), a_i \in \mathbb{R}, 1 \leqslant i \leqslant n, i \in \mathbb{N}\}$?

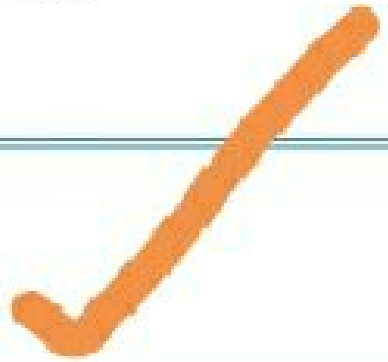
ect option

Reload Math Equatio

ϕ is Disconnected and A is Connected

ϕ is Connected and A is Disconnected

Both are Connected



Both are Disconnected

Question # 5 of 10 (Start time: 09:27:50 PM, 17 February 2021)

An open disc: $\{(x, y) : x^2 + y^2 < 1\}$ in $\mathbb{R}^2$ is - - - - - - .

Select the correct option

Relo

○	diconnected
○	disconnected polygonally
○	connected polygonally
○	none of these.

Tot

Boundary of the set $\{(x,y) : -n < x, y < n, (x,y) \neq (0,0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, is - - - -

elect the correct option

Reload Math

- $\{(x,y) \in \mathbb{R}^2 | x = \pm n, y = \pm n, n \in \mathbb{N}\} \cup \{(0,0)\}$
- $\{(x,y) \in \mathbb{R}^2 | x = \pm n, y = \pm n, n \in \mathbb{N}\}$
- $\{(0,0)\}$
- $\{(x,y) \in \mathbb{R}^2 | x = \pm n, y = \pm n, n \in \mathbb{N}\} \cap \{(0,0)\}$

In $\mathbb{R}^n$, if the line segment: $X = tX_2 + (1-t)X_1$, $0 < t < 1$, joining X_1 and X_2 lies in $S_\varepsilon(X_0)$, *then* $----$.

he correct option

Reload Math Equatio

$|X - X_0| < \varepsilon$

$|X - X_0| < 1 - \varepsilon$

$|X - X_0| < t$

$|X - X_0| < 1 - t$

Question # 4 of 10 (Start time: 09:26:31 PM, 17 February 2021) **Total Marks: 1**

If H is an open covering of a compact subset S, then S can be covered by _____ many sets from H.

Select the correct option

Reload Math Equations

- finitely
- infinitely
- both a and b
- non of these

uestion # 2 of 10 (Start time: 09:25:16 PM, 17 February 2021) Total Marks: 1

Set of isolated point(s) of the complement of set $\{(x,y) : -n < x, y < n, (x,y) \neq (0,0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, is $----$.

elect the correct option

Reload Math Equations

- $\{(x,y) \in \mathbb{R}^2 : x = y = |n|, n \in \mathbb{N}\} \cup \{(0,0)\}$
- $\{(0,0)\}$
- $\{(x,y) \in \mathbb{R}^2 : x = y = |n|, n \in \mathbb{N}\} \cap \{(0,0)\}$
- $\{(x,y) \in \mathbb{R}^2 : x = y = |n|, n \in \mathbb{N}\}$

Question # 2 o 10 (Start time: 09:25:12 PM, 17 February 2021)

Total Marks: 1

A sequence c points $\{X_r\}$ in R^n converges if and only if for each _____ there is an integer K such that _____ if $r, s \geqslant K$..

Select the corr ct option

Reload Math Equations

- $\varepsilon <$, $|X_r - X_s| < \varepsilon$
- $\varepsilon >$, $|X_r - X_s| > \varepsilon$
- $\varepsilon >$, $|X_r - X_s| < \varepsilon$
- $\varepsilon \neq$, $|X_r - X_s| > \varepsilon$

Start time: 09:24:35 PM, 17 February 2021)

In $\mathbb{R}^n$, which of the following is true about $\phi = \{\}$ and $A = \{(a_1, a_2, \ldots, a_n), a_i \in \mathbb{R}, 1 \leqslant i \leqslant n, i \in N\}$?

ption

Reload M

ϕ is Disconnected and A is Connected

ϕ is Connected and A is Disconnected

Both are Connected

Both are Disconnected

Limit points of set $S = \{(x, y) : -n < x, y < n, (x, y) \neq (0, 0), n \in \mathbb{N}\}$ in $\mathbb{R}^2$, - - - --.

ion

Reload Ma

$\{(0, 0)\} \cup \{(x, y) : x, y = \pm n, n \in \mathbb{N}\}$

$\{(0, 0)\} \cup S$

$\{(0, 0)\} \cup \{(x, y) : x, y = \pm n, n \in \mathbb{N}\} \cup S$

$\{(x, y) : x, y = \pm n, n \in \mathbb{N}\} \cup S$

Click to Save Answer & Move to Next Que

Question # 8 of 10 (Start time: 06:14:28 PM, 26 February 2021) Total Marks: 1

In $\mathbb{R}^n$, a function f is differentiable at X_0, $\Leftrightarrow \exists$ a linear function L in a way that $f(X) - f(X_0)$ can be approximated near X_0 by L satisfying;

Select the correct option

Reload Math Equations

○	$L(X - X_0) = LX - LX_0$
○	$L(XX_0) = (LX)(LX_0)$
○	$L\left(\frac{X}{X_0}\right) = \frac{LX}{LX_0},\ \lvert X_0\rvert \neq 0, LX_0 \neq 0$
○	None of the above

Click to Save Answer & Move to Next Question

MTH631:Quiz-3

Quiz Start Time: 06:08 PM, 26 February 2021

Question # 9 of 10 (Start time: 06:15:03 PM, 26 February 2021)

Total Marks: 1

In $\mathbb{R}^n$, monotonicity, limits inferior and superior of sequences, and divergence to $\pm\infty$ are undefined for $n > 1$ because $\mathbb{R}^n$ is - - - - - - - - .

Select the correct option

Reload Math Equations

○	complete
○	a Field
○	not ordered for $n > 1$
○	not compact for $n > 1$

Click to Save Answer & Move to Next Question

Question # 6 of 10 (Start time: 06:13:48 PM, 26 February 2021) Total Marks: 1

Suppose in $\mathbb{R}^2$, f, f_x, f_y and f_{xy} exist on neighborhood N of (x_0, y_0). Then $f_{yx}(x_0, y_0)$ exists, and $f_{yx}(x_0, y_0) = f_{xy}(x_0, y_0)$ because if f_{xy} is - - - - .

Select the correct option

Reload Math Equations

- bounded
- continuous
- differntiable
- partially differentiable

Click to Save Answer & Move to Next Question

MTH631:Quiz-3

Quiz Start Time: 06:10 PM, 26 February 2021

Question # 2 of 10 (Start time: 06:11:26 PM, 26 February 2021)

Total Marks: 1

If f is continuous on a compact set S in $\mathbb{R}^n$, then f – – – – on S.

Select the correct option

Reload Math Equations

- attains all its bounds
- is also uniformly continuous
- is also defined on all the limit points of "S"
- All above are equally valid

Click to Save Answer & Move to Next Question

Question # 9 of 10 (Start time: 06:05:42 PM, 26 February 2021) **Total Marks: 1**

A sufficient condition for a function of several variables to be differentiable at point is

Select the correct option

Reload Math Equations

○	only the partial derivative should exists at that point.
●	All partial derivatives exists and are continuous at that point
○	only limit at that point should exists.
○	None of these

Click to Save Answer & Move to Next Question

Question # 3 of 10 (Start time: 06:02:18 PM, 26 February 2021)

Total Marks: 1

$$\lim_{(x,y)\to(a,b)} \frac{\sin\sqrt{1-x^2-2y^2}}{\sqrt{1-x^2-2y^2}} = 1, \text{ if} \cdots\cdots.$$

Select the correct option

Reload Math Equations

○	$(a^2+2b^2) > 1$
○	$(a^2+2b^2) < 1$
○	$(a^2+2b^2) = 1$
○	$(a^2+2b^2) \geq 1$

Click to Save Answer & Move to Next Question

Question # 4 of 10 (Start time: 06:03:04 PM, 26 February 2021) Total Marks: 1

In $\mathbb{R}^2$, $f(X) = |X|^2$ and $\Phi = \left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$, then $\frac{\partial f(X)}{\partial \Phi} =$

Select the correct option

Reload Math Equations

○	$\frac{x_1 + x_2}{\sqrt{2}}$
○	$x_1 + x_2$
○	$\frac{x_1 + x_2}{2}$
○	$\sqrt{2}(x_1 + x_2)$

MTH631:Quiz-3

Quiz Start Time: 06:01 PM, 26 February 2021

Question # 8 of 10 (Start time: 06:05:07 PM, 26 February 2021)

Total Marks: 1

Let f be defined and continuous on a region S in $\mathbb{R}^n$. Suppose that X_1 and X_2 are in S and $f(X_1) < Y < f(X_2)$.

Then $f(X) = Y$ - - - - - - - X in S.

Select the correct option

Reload Math Equations

○	for some
○	for all

Click to Save Answer & Move to Next Question

Question # 1 of 10 (Start time: 06:01:18 PM, 26 February 2021) Total Marks: 1

$$\text{In } \mathbb{R}^2, \lim_{(x,y)\to(2,2)} \frac{\sin(x-y)}{\sqrt{x-y}} = \text{-----}.$$

Select the correct option

Reload Math Equations

○	∞
○	1
○	$\sqrt{2}$
○	0

MTH631:Quiz-3

Quiz Start Time: 05:41 PM, 26 February 2021

Question # 10 of 10 (Start time: 05:52:21 PM, 26 February 2021)

Total Marks: 1

How many *third* order partial derivatives of $g(x, y) = xy + x^2y^3$ exist in $\mathbb{R}^3$?

Select the correct option

Reload Math Equations

- 3
- 6
- 8
- 9

Click to Save Answer & Move to Next Question

Question # 10 of 10 (Start time: 05:53:24 PM, 26 February 2021) Total Marks: 1

The domain of the real valued function $f : \mathbb{R}^2 \to \mathbb{R}$ defined and given by;

$f(X) = \dfrac{\sin\sqrt{1-x^2-2y^2}}{\sqrt{1-x^2-2y^2}}$ is - - - - - of the region by the ellipse $x^2 + 2y^2 = 1$.

Select the correct option

Reload Math Equations

O	interior
O	interior and boundary
O	exterior
O	exterior and boundary

MTH631:Quiz-3

Quiz Start Time: 05:46 PM, 26 February 2021

Question # 5 of 10 (Start time: 05:50:04 PM, 26 February 2021)

Total Marks: 1

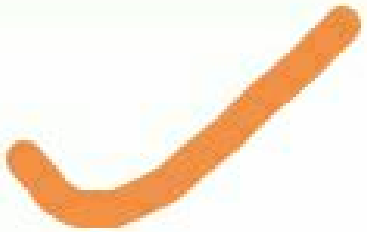
If a function f is *continuous* on a *compact* set S in $\mathbb{R}^n$, and $\alpha = \inf_{X \in S} f(X)$, $\beta = \sup_{X \in S} f(X)$,

then $f(X_1) = \alpha$ and $f(X_2) = \beta$ ------ X_1 and X_2 in S.

Select the correct option

Reload Math Equations

- for all
- for some



Click to Save Answer & Move to Next Question

Identify the false statement(s)

Select the correct option

○	The partial derivative is a special case of directional derivative.
○	For a functions of n variables $f(\mathbf{X})$ the partial derivative with respect to variable
○	The partial derivative of the function $f(x, y, z) = 3xyz + 2x^2 + z^2$ with respect to third variable is
○	None of these

Click to Save Answer

Question # 8 of 10 (Start time: 05:52:15 PM, 26 February 2021) Total Marks: 1

In $\mathbb{R}^n$, $f(X) = \dfrac{1}{|X - X_0|}$, and $\lim\limits_{X \to X_0} f(X) = \infty$, then $f(X) > M > 0 \Rightarrow 0 < |X - X_0| < \delta = - - - - -$.

Select the correct option

Reload Math Equations

O	$\dfrac{1}{\sqrt{M}}$
O	$\sqrt{M}$
O	$\dfrac{1}{M}$
O	M

Click to Save Answer & Move to Next Question

Question # 4 of 10 (Start time: 05:49:36 PM, 26 February 2021) Total Marks: 1

In $\mathbb{R}^n$, $\lim_{X \to X_0} f(X) = -\infty$, if

Select the correct option

Reload Math Equations

- $\lim_{X \to X_0} f(-X) = \infty$
- $\lim_{X \to X_0} (-f)(X) = \infty$ 
- $\lim_{X \to -X_0} f(X) = \infty$
- $\lim_{-X \to X_0} f(X) = \infty$

MTH631:Quiz-3

Quiz Start Time: 05:46 PM, 26 February 2021

Question # 3 of 10 (Start time: 05:49:04 PM, 26 February 2021)

Total Marks: 1

In $\mathbb{R}^n$, monotonicity, limits inferior and superior of sequences, and divergence to $\pm\infty$ are undefined for $n > 1$ because $\mathbb{R}^n$ is - - - - - - - - .

Select the correct option

Reload Math Equations

- complete
- a Field
- not ordered for $n > 1$ ✓
- not compact for $n > 1$

Question # 10 of 10 (Start time: 05:13:08 PM, 26 February 2021)

Total Marks: 1

In $\mathbb{R}^n$, a function f is differentiable at X_0, $\Leftrightarrow \exists$ a linear function L in a way that $f(X) - f(X_0)$ can be approximated near X_0 by L satisfying $L(X \pm X_0) = LX \pm LX_0$ such that $f(X) - f(X_0) = L(X - X_0) + E(X)(|X - X_0|)$ and $\lim_{X \to X_0} E(X) - - - -$.

Select the correct option

Reload Math Equations

- =1
- >0
- <0
- =0

Click to Save Answer & Move to Next Question

Question # 8 of 10 (Start time: 05:12:19 PM, 26 February 2021) Total Marks: 1

If $g(x,y)=\sqrt{1-x^2-2y^2}$, $f(t)=\begin{cases}\frac{\sin t}{t}, & t\neq 0\\ 1, & t=0\end{cases}$,

Select the correct option

Reload Math Equations

O	$\mathbb{R}$
O	$\mathbb{R}^2$
O	$\{(x,y): x^2-2y^2 \geqslant 1\}$
O	$\{(x,y): x^2-2y^2 \leqslant 1\}$

Click to Save Answer & Move to Next Question

Question # 3 of 10 (Start time: 05:08:54 PM, 26 February 2021) Total Marks: 1

A set $A \subset R$ of real numbers is ----------if there exists a real number $m \in R$, such that
$x \geq m$ for every $x \in A$.

Select the correct option

- bounded below
- uniformly continuous
- bounded above
- None of these

Question # 5 of 10 (Start time: 05:10:10 PM, 26 February 2021)

Analogous to the derivative of a function of one variable in $\mathbb{R}^2$, the directional derivative of a function f at X_0 in $\mathbb{R}^n$ has - - - - - - value(s).

Select the correct option

O	multiple
O	infinite many
O	unique
O	integral

If a function f is *continuous* on a *compact* set S in $\mathbb{R}^n$, and $\alpha = \inf_{X \in S} f(X)$, $\beta = \sup_{X \in S} f(X)$,

then $f(X_1) = \alpha$ and $f(X_2) = \beta$ ------ X_1 and X_2 in S.

ct the correct option

Relo

- for all
- for some

Click to Save/Answer & Move to Nex

Question # 10 of 10 (Start time: 05:07:14 PM, 26 February 2021) Total Marks: 1

$$\text{In } \mathbb{R}^2,\ f(x,y) = \begin{cases} \dfrac{\sin\sqrt{1-x^2-2y^2}}{\sqrt{1-x^2-2y^2}}, & x^2+2y^2<1 \\ 1 & x^2+2y^2=1 \end{cases}$$

Select the correct option

Reload Math Equations

- continuous
- discontinuous

Click to Save Answer & Move to Next Question

Question # 9 of 10 (Start time: 05:06:37 PM, 26 February 2021) Total Marks: 1

In $\mathbb{R}^2$, $f(X) = |X|^2$ and $\Phi = \left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$, then $\frac{\partial f(X)}{\partial \Phi} =$

Select the correct option

Reload Math Equations

O	$\frac{x_1 + x_2}{\sqrt{2}}$
O	$x_1 + x_2$
O	$\frac{x_1 + x_2}{2}$
O	$\sqrt{2}(x_1 + x_2)$

Click to Save Answer & Move to Next Question

If a function f is continuous on a Compact set S in $\mathbb{R}^n$, then f is - - - - - - - - on S.

Select the correct option

Reload Math Equations

O	bounded above
O	bounded below
O	unbounded
O	bounded

If $g(x,y)=\sqrt{1-x^2-2y^2}$, $f(t)=\begin{cases}\frac{\sin t}{t}, & t\neq 0\\ 1, & t=0\end{cases}$.

Select the correct option

Reload Math Equations

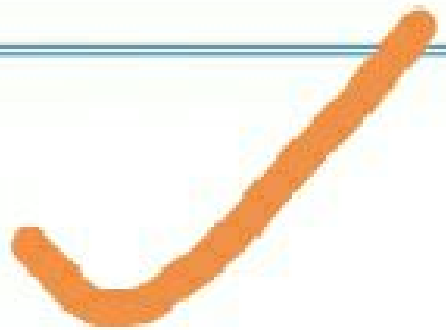
○	$\mathbb{R}$
○	$\mathbb{R}^2$
○	$\{(x,y): x^2-2y^2 \geqslant 1\}$
○	$\{(x,y): x^2-2y^2 \leqslant 1\}$

In $\mathbb{R}^n$, if the first order partial derivative of a function $f(X)$ exits at X_0, then it is essentially continuous at X_0.

lect the correct option

Reload Math Equ

- True
- False



Click to Save Answer & Move to Next Question

Question # 7 of 10 (Start time: 05:04:52 PM, 26 February 2021) Total Marks: 1

In $\mathbb{R}^n$, the function $f(X)$ is continuous at X_0, if $\lim_{X \to X_0} f(X) = f(X_0)$, then - - - - - - .

Select the correct option

Reload Math Equations

○	X_0 is in the domian D_f and limit point of D_f
○	X_0 is in the domian D_f but not a limit point of D_f
○	X_0 is not in the domian D_f but a limit point of D_f
○	neither X_0 is in the domian D_f nor the limit point of D_f

Click to Save Answer & Move to Next Question

Question # 5 of 10 (Start time: 05:03:31 PM, 26 February 2021) Total Marks: 1

Analogous to the derivative of a function of one variable in $\mathbb{R}^2$, the directional derivative of a function f at X_0 in $\mathbb{R}^n$ has - - - - - - value(s).

Select the correct option

Reload Math Equations

O	multiple
O	infinite many
O	unique
O	integral

In $\mathbb{R}^n$, monotonicity, limits inferior and superior of sequences, and divergence to $\pm\infty$ are undefined for $n > 1$ because $\mathbb{R}^n$ is - - - - - - - - .

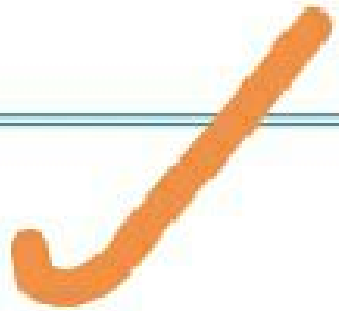
option

Reload

complete

a Field

not ordered for $n > 1$



not compact for $n > 1$

Question # 4 of 10 (Start time: 05:02:49 PM, 26 February 2021) Total Marks: 1

A sufficient condition for a function of several variables to be differentiable at point is

Select the correct option

Reload Math Equations

- only the partial derivative should exists at that point.
- All partial derivatives exists and are continuous at that point
- only limit at that point should exists.
- None of these

Click to Save Answer & Move to Next Question

Question # 1 of 10 (Start time: 05:00:10 PM, 26 February 2021) Total Marks: 1

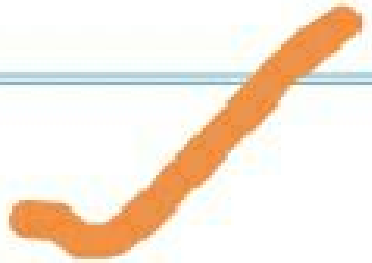
Let f be defined on an interval I in R^2. Suppose that x_1 and x_2 are in I and $f(x_1) < y < f(x_2)$.

Then $f(x) = y$ for some x in I.

Select the correct option

Reload Math Equations

- False
- True



Click to Save Answer & Move to Next Question

Question # 2 of 10 (Start time: 05:01:01 PM, 26 February 2021) Total Marks: 1

If $f(x,y,z) = \cos\left(\frac{1}{x^2+2y^2+z^2}\right)$ then $\lim_{|X|\to\infty} f(X) =$ _____.

Select the correct option

Reload Math Equations

O	1
O	0
O	-1
O	infinite

Click to Save Answer & Move to Next Question

Question # 3 of 10 (Start time: 05:01:42 PM, 26 February 2021) Total Marks: 1

The domain of the real valued function $f : \mathbb{R}^n \to \mathbb{R}$ defined and given by;
$f(X) = \left(1 - x_1^2 - x_2^2 - \cdots - x_2^n\right)^{-1}$ is - - - - - .

Select the correct option

Reload Math Equations

- $\{X \mid |X| = 1\}$
- $\{X \mid |X| \neq 1\}$

Click to Save Answer & Move to Next Question

MTH631:Quiz-3

Quiz Start Time: 04:51 PM, 26 February 2021

Question # 8 of 10 (Start time: 04:56:51 PM, 26 February 2021)

Total Marks: 1

Identify the false statement(s)

Select the correct option

Reload Math Equations

○	The partial derivative is a special case of directional derivative.
○	For a functions of n variables $$f(\mathbf{X})$$ the partial derivative with respect to variable
○	The partial derivative of the function $$f(x,y,z) = 3xyz + 2x^2 + z^3$$ with respect to third variable is
○	None of these

Question # 10 of 10 (Start time: 04:58:31 PM, 26 February 2021) Total Marks: 1

In $\mathbb{R}^2$, $f(x,y) = \begin{cases} \dfrac{\sin\sqrt{1-x^2-2y^2}}{\sqrt{1-x^2-2y^2}}, & x^2+2y^2<1 \\ 1, & x^2+2y^2=1 \end{cases}$

Select the correct option

Reload Math Equations

- continuous
- discontinuous

Question # 5 of 10 (Start time: 04:54:40 PM, 26 February 2021) Total Marks: 1

$$\text{If } g(x,y) = \sqrt{1-x^2-2y^2},\ f(t) = \begin{cases} \frac{\sin t}{t}, & t \neq 0 \\ 1, & t = 0 \end{cases},$$

Select the correct option

Reload Math Equations

O	$\mathbb{R}$
O	$\mathbb{R}^2$
O	$\{(x,y) : x^2 - 2y^2 \geqslant 1\}$
O	$\{(x,y) : x^2 - 2y^2 \leqslant 1\}$

Click to Save Answer & Move to Next Question

Question # 7 of 10 (Start time: 04:56:05 PM, 26 February 2021) Total Marks: 1

If f is continuous on a compact set S in $\mathbb{R}^n$, then f ---- on S.

Select the correct option

Reload Math Equations

- attains all its bounds
- is also uniformly continuous
- is also defined on all the limit points of "S"
- All above are equally valid

MTH631:Quiz-3

Quiz Start Time: 04:51 PM, 26 February 2021

Question # 9 of 10 (Start time: 04:57:28 PM, 26 February 2021)

Total Marks: 1

If a function f is *continuous* on a *compact* set S in $\mathbb{R}^n$, and $\alpha = \inf_{X \in S} f(X)$, $\beta = \sup_{X \in S} f(X)$,

then $f(X_1) = \alpha$ and $f(X_2) = \beta$ ------ X_1 and X_2 in S.

Select the correct option

Reload Math Equations

- for all
- for some

MTH631:Quiz-3

Quiz Start Time: 04:51 PM, 26 February 2021

Question # 4 of 10 (Start time: 04:53:55 PM, 26 February 2021)

Total Marks: 1

$$\text{In } \mathbb{R}^2, \quad \lim_{(x,y)\to(2,2)} \frac{\sin(x-y)}{\sqrt{x-y}} = \text{-----}.$$

Select the correct option

Reload Math Equations

○	∞
○	1
○	$\sqrt{2}$
○	0

Click to Save Answer & Move to Next Question

Question # 10 of 10 (Start time: 04:58:52 PM, 26 February 2021)

If a function f is continuous on a Compact set S in $\mathbb{R}^n$, then f is - - - - - - - - on S.

Select the correct option

Reload M

- bounded above
- bounded below
- unbounded
- bounded

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Question # 3 of 10 (Start time: 05:19:59 PM, 26 February 2021)

In $\mathbb{R}^n$, a function f is differentiable at X_0, $\Leftrightarrow \exists$ a linear function L in a way that $f(X) - f(X_0)$ can be approximated near X_0 by L satisfying;

Select the correct option

- $L(X - X_0) = LX - LX_0$
- $L(XX_0) = (LX)(LX_0)$
- $L\left(\frac{X}{X_0}\right) = \frac{LX}{LX_0}, \ |X_0| \neq 0, LX_0 \neq 0$
- None of the above

Click to Save Ans

$$\lim_{(x,y)\to(a,b)} \frac{\sin\sqrt{1-x^2-2y^2}}{\sqrt{1-x^2-2y^2}} = 1, \text{ if} \text{-------}.$$

$(a^2+2b^2) > 1$

$(a^2+2b^2) < 1$

$(a^2+2b^2) = 1$

$(a^2+2b^2) \geq 1$

Question # 5 of 10 (Start time: 05:56:58 PM, 26 February 2021)

For the function

$$f(x, y) = 3x^2y^3 + xy$$

in two variables,

Select the correct option

- 0
- -1
- 1
- None of these

Select the correct option

$f_{yx}(0,0)$ =.....

- 0
- -1
- 1
- None of these