uestion # 5 of 10 ( Start time: 10:44:09 PM, 21 June 2022 ) Total Marks: 1

If $f(x) = \sum_{n=0}^{\infty} a_n (x - x_0)^n$, having $R > 0$ as a radius of convergence, and $f(x)$ is continuous and differentiable in its intervel of convergence, then radius of convergence of $f'(x)$ is - - - - - - - .

lect the correct option

Reload Math Equations

- $R - h, h < 0$
- also $R$
- $R + h, h > 0$
- $\frac{1}{R}, R \neq 0$

Click to Save Answer & Move to Next Question

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11:59 AM

Jun 22, 2022
AM 11:56

IC210203364: MARIA KHADIM

TH631:Quiz #1

uestion # 4 of 10 ( Start time: 11:11:35 AM, 22 June 2022 )

For the power series, define $R$ in the extended real numbers by $\frac{1}{R} = \limsup_{n\to\infty} |a_n|^{1/n}$. In particular, $R = \infty$ if

lect the correct option

- $\limsup_{n\to\infty} |a_n|^{1/n} = 0.$
- $\limsup_{n\to\infty} |a_n|^{1/n} = \infty.$

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For the power series, define $R$ in the extended real numbers by $\frac{1}{R} = \limsup_{n\to\infty} |a_n|^{1/n}$. In particular, $R = \infty$ if

**Select the correct option**

Reload Math Equations

- $\limsup_{n\to\infty} |a_n|^{1/n} = 0.$
- $\limsup_{n\to\infty} |a_n|^{1/n} = \infty.$

Click to Save Answer & Move to Next Question

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**Question # 3 of 10 ( Start time: 07:56:09 AM, 22 June 2022 )** **Total Marks:** 1

The term by term differentiation of the series

$$\sum_{n=0}^{\infty}(-1)^n\frac{x^{2n}}{(2n)!}, \quad -\infty < x < \infty$$

becomes

**Select the correct option**

Reload Math Equations

- $\sum_{n=0}^{\infty}\frac{x^{2n}}{(2n)!}, \quad -\infty < x < \infty.$
- $\sum_{n=0}^{\infty}(-1)^n\frac{x^{2n+1}}{(2n+1)!}, \quad -\infty < x < \infty$
- $\sum_{n=0}^{\infty}(-1)^n\frac{x^{2n}}{(2n)!}, \quad -\infty < x < \infty.$
- $\sum_{n=20}^{\infty}(-1)^n\frac{x^{2n+1}}{(2n+1)!}, \quad -\infty < x < \infty.$

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MTH631:Quiz #1 Quiz Start Time: 10:56 AM, 22 June 2022

Question # 5 of 10 ( Start time: 10:59:41 AM, 22 June 2022 ) Total Marks: 1

$\tan x$ is an odd function, its derivatives of even order are equal to

Select the correct option

Reload Math Equations

- $1$ at $x_0 = 0$.
- $\pi$ at $x_0 = 0$.
- $0$ at $x_0 = 0$.
- $\tan x \sec x$ at $x_0 = 0$.

Click to Save Answer & Move to Next Question

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Total Marks: 1

estion # 5 of 10 ( Start time: 10:44:09 PM, 21 June 2022 )

If $f(x) = \sum_{n=0}^{\infty} a_n(x - x_0)^n$, having $R > 0$ as a radius of convergence, and $f(x)$ is continuous and differentiable in its interval of convergence, then radius of convergence of $f'(x)$ is - - - - - - .

lect the correct option

Reload Math Equations

- $R - h, h < 0$
- also $R$
- $R + h, h > 0$
- $\frac{1}{R}, R \neq 0$

Click to Save Answer & Move to Next Question

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Let $f$ be defined by a power series with finite radius of convergence $R$. Then $\lim_{x\to(x_0+R)-} f(x) = \sum_{n=0}^{\infty} a_n R^n$ only if

**Select the correct option**

Reload Math Equations

- $\sum_{n=0}^{\infty} a_n R^n$ converges
- None of these.
- $\sum_{n=0}^{\infty}(-1)^n a_n R^n$ converges.
- $\sum_{n=0}^{\infty} b_n R^n$ is uniformly convergent.

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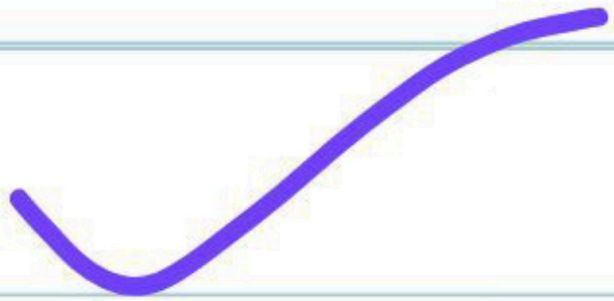
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Question # 5 of 10 ( Start time: 07:58:07 AM, 22 June 2022 )

$$\lim_{n\to\infty} \frac{r^n}{n!} =$$

Select the correct option

- $= n!, \quad 0 < r < \infty$
- $= 0, \quad 0 < r < \infty$



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Quiz
quiz.vu.edu.pk



f be defined by a power series with finite radius of convergence $R$. Then $\lim_{x\to(x_0+R)^-} f(x) = \sum_{n=0}^{\infty} a_n R^n$ only if

ct the correct option

- None of these.
- $\sum_{n=0}^{\infty} a_n R^n$ converges
- $\sum_{n=0}^{\infty} (-1)^n a_n R^n$ converges.
- $\sum_{n=0}^{\infty} b_n R^n$ is uniformly convergent.

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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June

Question # 6 of 10 ( Start time: 10:02:05 PM, 21 June 2022 )

Total M

If $f(x) = \sin x$, then

Select the correct option

Reload Math Equa

- $f''(x) = \sin x$
- $\|f^{(k)}\|_{(-\infty,\infty)} = 1,\ k \geq 0$
- $f^{2m+1}(0) = 1, m \geq 0$
- $f^{2m}(0) = 1$

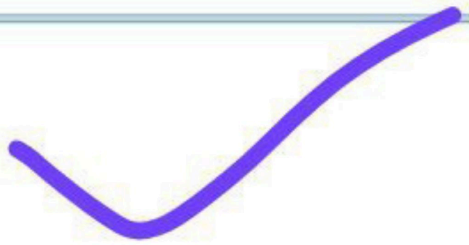
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A fundamental property of the exponential function: that $(e^x)^{-1} = e^{-x}$.

**Select the correct option**

- ○ False.
- ● True.



C

The power series expansion of $f(x) = \sin x$ about $x_0 = 0$ is

**Select the correct option**

- $\sin x = \sum_{n=0}^{\infty}(-1)^n \frac{x^{2n}}{(2n)!}, \quad -\infty < x < \infty.$
- $\sum_{n=0}^{\infty}(-1)^n \frac{x^{2n+1}}{(2n+1)!}, \quad -\infty < x < \infty,$
- $\sum_{n=0}^{\infty} \frac{x^{2n}}{(2n)!}, \quad -\infty < x < \infty,.$
- $\sum_{n=0}^{\infty} \frac{x^{2n+1}}{(2n+1)!}, \quad -\infty < x < \infty.$

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**Question # 3 of 10 ( Start time: 10:26:08 PM, 21 June 2022 )**

A power series $f(x) = \sum_{n=0}^{\infty} a_n (x - x_0)^n$ with positive radius of convergence $R$

**Select the correct option**

- has derivatives of all orders in its interval of convergence.
- has continuous limit.

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**Question # 1 of 10 ( Start time: 10:39:51 PM, 21 June 2022 )** **Total Marks: 1**

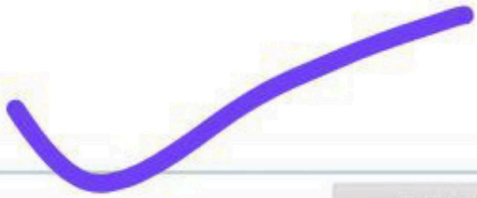
For the series, $\frac{1}{3} - x + \frac{x^2}{3^2} - x^3 + \frac{x^4}{3^4} - x^5 + \cdots$,

Limit Superior of $\left|a_n\right|^{\frac{1}{n}} = - - - -$.

**Select the correct option**

Reload Math Equations

- 1/3
- 1



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Question # 10 of 10 ( Start time: 10:31:32 PM, 21 June 2022 )

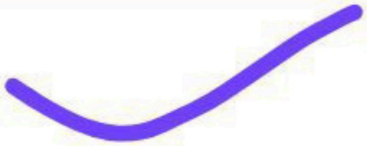
If a function $f(x)$, having the derivatives of all orders on some neighbourhood $N(0)$ of 0,

be chosen first and the Taylor series $\sum_{n=0}^{\infty} \frac{f^{(n)}(0)}{n!} x^n$ be constructed,

then this power series will have $f(x)$ as its sum on $N(0)$.

Select the correct option

- (●) False
- ( ) True



Click to Save Answer

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Question # 8 of 10 ( Start time: 10:29:48 PM, 21 June 2022 )

For the series $\sum_{n=1}^{\infty} \cos \frac{x}{n}$

**Select the correct option**

- term by term differentiating yeilds $\sum_{n=1}^{\infty} \frac{-1}{n} \sin \frac{x}{n}$
- term by term differentiating yeilds $\sum_{n=1}^{\infty} \frac{1}{n} \sin \frac{1}{n}$

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Question # 4 of 10 ( Start time: 10:42:32 PM, 21 June 2022 ) Total Marks: 1

The term by term differentiation of the series is $S(x) = \sum_{n=0}^{\infty}(-1)^n \frac{x^{2n+1}}{(2n+1)!}$

Select the correct option

Reload Math Equations

- None of these.
- $\sum_{n=0}^{\infty} \frac{x^{2n+1}}{(2n+1)!}$.
- $\sum_{n=0}^{\infty}(-1)^n \frac{x^{2n}}{(2n)!}$
- $\sum_{n=0}^{\infty}(-1)\frac{x^{2n+1}}{(2n+1)!}$.

Click to Save Answer & Move to Next Question

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Question # 3 of 10 ( Start time: 10:41:27 PM, 21 June 2022 ) Total Marks: 1

If $(-R, R)$ is the interval of convergence of the power series $f(x) = \sum_{n=0}^{\infty} a_n x^n$, then the convergence of power series at $x = \pm R$, depends on the - - - - - - .

Select the correct option

Reload Math Equations

- nature of $\sum_{n=0}^{\infty} x^n$
- length of interval of convergence
- continuity of $f(x)$
- nature of sequence $\{a_n\}_{n \in N}$

Click to Save Answer & Move to Next Question

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Question # 2 of 10 ( Start time: 10:40:37 PM, 21 June 2022 ) Total Marks: 1

For the power series, define $R$ in the extended real numbers by $\frac{1}{R} = \limsup_{n\to\infty} |a_n|^{1/n}$. In particular, $R = 0$ if

Select the correct option

Reload Math Equations

- $\limsup_{n\to\infty} |a_n|^{1/n} = \infty$.
- $\limsup_{n\to\infty} |a_n|^{1/n} = 0$.

Click to Save Answer & Move to Next Question

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MTH631:Quiz #1

Quiz Start Time: 10:39 PM, 21 June 2022

Question # 8 of 10 ( Start time: 10:47:06 PM, 21 June 2022 )

Total Marks: 1

If a function $f(x)$, having the derivatives of all orders on some neighbourhood $N(0)$ of 0,

be chosen first and the Taylor series $\sum_{n=0}^{\infty} \frac{f^{(n)}(0)}{n!} x^n$ be constructed,

then this power series will have $f(x)$ as its sum on $N(0)$.

Select the correct option

Reload Math Equations

- True
- False

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MTH631:Quiz #1

Quiz Start Time: 10:39 PM, 21 June 2022

Question # 7 of 10 ( Start time: 10:46:02 PM, 21 June 2022 )

Total Marks: 1

A power series is continuous and differentiable in

Select the correct option

Reload Math Equations

- its interval of convergence.
- in every interval $[x_0 - r, x_0 + r]$ such that $0 < r$.

Click to Save Answer & Move to Next Question

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Question # 6 of 10 ( Start time: 10:45:22 PM, 21 June 2022 ) Total Marks: 1

The radius of convergence of $\sum a_n(x-x_0)^n$ is given by

Select the correct option

Reload Math Equations

- $R = \lim_{n\to\infty}\left|\frac{a_{n+1}}{a_n}\right|$ if the limit exists in the extended real number system.
- $\frac{1}{R} = \lim_{n\to\infty}\left|\frac{a_{n+1}}{a_n}\right|$ if the limit exists in the extended real number system.



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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June

Question # 1 of 10 ( Start time: 09:56:53 PM, 21 June 2022 )

Total M

If $f(x) = \sin x$, then $\|f^{(k)}\|_{(-\infty,\infty)} =$

Select the correct option

Reload Math Equ

- ∞.
- 1.
- constant.
- 0.

Click to Save Answer & Move to Next Question

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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June 2022

Question # 6 of 10 ( Start time: 10:02:05 PM, 21 June 2022 )

Total Marks: 1

If $f(x) = \sin x$, then

Select the correct option

Reload Math Equations

- $f''(x) = \sin x$
- $||f^{(k)}||_{(-\infty,\infty)} = 1,\ k \geq 0$
- $f^{2m+1}(0) = 1, m \geq 0$
- $f^{2m}(0) = 1$

Click to Save Answer & Move to Next Question

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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June 2022

Question # 5 of 10 ( Start time: 10:01:20 PM, 21 June 2022 )

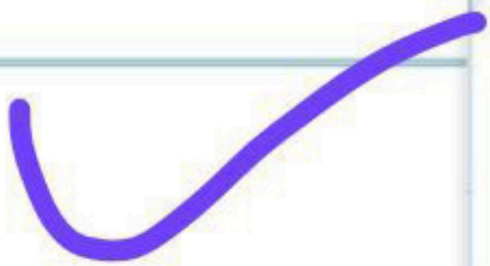
Total Marks: 1

The radius of convergence of $\sum a_n(x-x_0)^n$ is given by

Select the correct option

Reload Math Equations

- $R = \lim_{n\to\infty}\left|\frac{a_{n+1}}{a_n}\right|$ if the limit exists in the extended real number system.
- $\frac{1}{R} = \lim_{n\to\infty}\left|\frac{a_{n+1}}{a_n}\right|$ if the limit exists in the extended real number system.



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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June 2022

Question # 9 of 10 ( Start time: 10:05:56 PM, 21 June 2022 )

Total Marks: 1

The infinite series expansion of $\cos x$ for $-\infty < x < \infty$ is given by

Select the correct option

Reload Math Equations

- $\sum_{n=0}^{\infty}(-1)^n \frac{x^{2n}}{(n+1)!}$
- None of these
- $\sum_{n=0}^{\infty}(-1)^n \frac{x^n}{n!}$
- $\sum_{n=0}^{\infty}(-1)^n \frac{x^{2n}}{2n!}$

Click to Save Answer & Move to Next Question

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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June 2022

Question # 8 of 10 ( Start time: 10:04:18 PM, 21 June 2022 )

Total Marks: 1

Let $f$ be defined by a power series with finite radius of convergence $R$. Then $\lim_{x \to (x_0+R)^-} f(x) = \sum_{n=0}^{\infty} a_n R^n$ only if

Select the correct option

Reload Math Equations

- None of the above
- $\sum_{n=0}^{\infty}(-1)^n a_n R^n$ converges
- $\sum_{n=0}^{\infty} b_n R^n$ is convergent.
- $\sum_{n=0}^{\infty} a_n R^n$ converges.

Click to Save Answer & Move to Next Question

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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June 2022

Question # 7 of 10 ( Start time: 10:03:02 PM, 21 June 2022 )

Total Marks: 1

The limit of a uniformly convergent series of integrable functions is always

Select the correct option

Reload Math Equations

- not integrable
- None of these
- integrable
- differentiable

Click to Save Answer & Move to Next Question

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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June

Question # 1 of 10 ( Start time: 09:56:53 PM, 21 June 2022 )

Total M

If $f(x) = \sin x$, then $||f^{(k)}||_{(-\infty,\infty)} =$

Select the correct option

Reload Math Equ

- ∞.
- 1.
- constant.
- 0.

Click to Save Answer & Move to Next Question

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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June

Question # 2 of 10 ( Start time: 09:57:54 PM, 21 June 2022 )

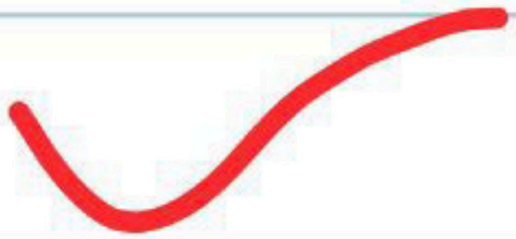
Total M

For a power series, if the radius of convergence is $R = \infty$, then power series is said to:

Select the correct option

Reload Math Equ

- converge everwhere in the given domain



- converge nowhere (converge at single point)

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MTH631:Quiz #1

Quiz Start Time: 09:56 PM, 21 June

Question # 10 of 10 ( Start time: 10:07:04 PM, 21 June 2022 )

Total M

An infinite series of the form $\sum_{n=0}^{\infty} a_n (x - x_0)^n$, is called a power series in $x - x_0$, where

Select the correct option

Reload Math Equ

- $x_0$ is constant.
- $x_0$ and $a_0, a_1, \ldots$ are constants.
- $x_0$ and $a_0, a_1, \ldots$ are variables.
- $a_0, a_1, \ldots$ are constants.

Click to Save Answer & Move to Next Question

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