MTH631:Quiz #1

Question # 10 of 10 (Start time: 03:51:30 PM, 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, $R = 0$ if

Select the correct option

○	$\limsup_{n\to\infty} \lvert a_n\rvert^{1/n} = 0.$
●	$\limsup_{n\to\infty} \lvert a_n\rvert^{1/n} = \infty.$

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3:51 PM
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Question # 9 of 10 (Start time: 03:51:07 PM, 22 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

3:53 PM

MTH631:Quiz #1

Question # 1 of 10 (Start time: 03:53:11 PM, 22 June 2022)

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

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

3:50 PM 4G 0 B/s 70

uestion # 6 of 10 (Start time: 03:49:41 PM, 22 June 2022)

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

elect the correct option

●	converge everwhere in the given domain
○	converge nowhere (converge at single point)

3:50 PM 17.4 K/s 70

MTH631:Quiz #1

Question # 7 of 10 (Start time: 03:50:16 PM, 22 June 2022)

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

Select the correct option

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

3:50 PM 16.3 K/s 70

Question # 8 of 10 (Start time: 03:50:44 PM, 22 June 2022)

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

Select the correct option

- (●) True.
- ( ) False.

3:48 PM 707 B/s 69

MC210200422: MARIAM ZAFAR

MTH631:Quiz #1

Question # 3 of 10 (Start time: 03:48:03 PM, 22 June 2022)

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

Select the correct option

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

3:48 PM 93 B/s 70

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MC210200422: MARIAM ZAFAR

MTH631:Quiz #1

Question # 4 of 10 (Start time: 03:48:33 PM, 22 June 2022)

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

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

3:49 PM
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Question # 5 of 10 (Start time: 03:49:16 PM, 22 June 2022)

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

Select the correct option

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

3:54 PM
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MTH631:Quiz #1

Question # 2 of 10 (Start time: 03:53:44 PM, 22 June 2022)

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

Select the correct option

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

Click

MTH631:Quiz #1

Question # 3 of 10 (Start time: 03:54:22 PM, 22 June 2022)

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

Select the correct option

●	continuous and differentiable in its interval of convergence.
○	continuous.
○	continuous and differentiable in the extended real number system.
○	continuous and differentiable in the real number system.

3:54 PM
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For the series $\sum_{n=1}^{\infty} \cos \frac{x}{n}$

Select the correct option

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

3:55 PM

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MC210200880: FATIMA QABAD

MTH631:Quiz #1

Question # 5 of 10 (Start time: 03:55:10 PM, 22 June 2022)

A power series is continuous and differentiable in

Select the correct option

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

Question # 5 of 10 (Start time: 03:55:10 PM, 22 June 2022)

A power series is continuous and differentiable in

Select the correct option

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

Question # 6 of 10 (Start time: 03:55:31 PM, 22 June 2022)

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

Select the correct option

○	False.
●	True.

Question # 7 of 10 (Start time: 03:55:49 PM, 22 June 2022)

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

Select the correct option

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

Question # 8 of 10 (Start time: 03:56:09 PM, 22 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

- (●) True
- ( ) False

3:56 PM 165 B/s 72

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MC210200880: FATIMA QABAD

MTH631:Quiz #1 Qu

Question # 9 of 10 (Start time: 03:56:25 PM, 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

Select the correct option

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

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3:56 PM
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MC210200880: FATIMA QABAD

MTH631:Quiz #1

Question # 10 of 10 (Start time: 03:56:51 PM, 22 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.

4:02 PM 515 B/s 74

Question # 1 of 10 (Start time: 04:02:39 PM, 22 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 intervel of convergence, then radius of convergence of $f'(x)$ is - - - - - - .

Select the correct option

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

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4:03 PM 4G 1.5 K/s 74

MC210203385: BENISH AKRAM

MTH631:Quiz #1 Qu

Question # 2 of 10 (Start time: 04:03:07 PM, 22 June 2022)

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 $|a_n|^{\frac{1}{n}} = ---.$

Select the correct option

○	1/3
●	1

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Question # 3 of 10 (Start time: 04:03:24 PM, 22 June 2022)

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

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

4:04 PM
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Question # 4 of 10 (Start time: 04:04:09 PM, 22 June 2022)

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

Select the correct option

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

4:05 PM 1.2 K/s 75

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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

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

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4:05 PM 520 B/s 75

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Question # 5 of 10 (Start time: 04:04:57 PM, 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

Select 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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4:05 PM

MC210203385: BENISH AKRAM

MTH631:Quiz #1

Question # 6 of 10 (Start time: 04:05:40 PM, 22 June 2022)

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

Select the correct option

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

4:06 PM
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MC210203385: BENISH AKRAM

MTH631:Quiz #1

Question # 7 of 10 (Start time: 04:06:04 PM, 22 June 2022)

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

Select the correct option

- None of these
- integrable
- not integrable
- differentiable

4:06 PM
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MTH631:Quiz #1

Question # 8 of 10 (Start time: 04:06:32 PM, 22 June 2022)

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

Select the correct option

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

4:06 PM
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Question # 9 of 10 (Start time: 04:06:52 PM, 22 June 2022)

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

Select the correct option

- [x] 1.
- [ ] ∞.
- [ ] constant.
- [ ] 0.

4:07 PM 795 B/s 76

Question # 10 of 10 (Start time: 04:07:16 PM, 22 June 2022)

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

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

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