

MTH621 Quiz#2 Module (126-151)

Due Date 2-4 August 2021

- Mid.Mth621 sol. Files preparation group 25feb2019 quiz#2 (pg10)
- MTH621-QUIZ-Unsolved-By-MTA quiz2 (pg10)
- MTH621 Quiz file current 02-21-2021 11.26 Quiz2 (pg21)
- (same)Mid.Mth621.sol.files preparation Group Quiz2 21feb2021 (pg21)
- MTH621-QUIZ-BY-KINAT-SHAFIQUE-2 (pg52)
- 621 final term (pg48)
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- Mth621.Quiz#2.2 Aug2021(126to151)Made by stylish (pg61)
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Question # 10 of 10 (Start time: 02:15:53 PM, 28 November 2017)

The limit of the sequence

$$s_n = \frac{1}{n} + \frac{2(1 + 3/n)}{1 + 1/n}.$$

Select the correct option



1



4



3



2



Pg36



Question # 6 of 10 (Start time: 02:11:19 PM, 28 November 2017)

$$\limsup_{n \rightarrow \infty} s_n = \infty \text{ if}$$

Select the correct option

- | | |
|----------------------------------|---------------------------------|
| ☒ | $\{s_n\}$ is not bounded above. |
| ☐ | $\{s_n\}$ has unique limit. |
| ☐ | $\{s_n\}$ is convergent. |
| ☐ | $\{s_n\}$ has limit inferior. |



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MTH621: Quiz 2

Question # 9 of 10 (Start time: 02:14:42 PM, 28 November 2017)

Every Cauchy sequence has a

▶ Select the correct option



convergent subsequence.



increasing subsequence.



decreasing subsequence.



positive subsequence.

MTH621: Quiz 2

Question # 3 of 10 (Start time: 02:08:24 PM, 28 November 2017)

Which of the following given sets is compact subset of $\mathbb{R}$.

Select the correct option

☐	$(1,5]$
☐	$\{1,2,4\}$
☒	$[0,1]$
☐	$(2,3)$



Question # 5 of 10 (Start time: 02:10:35 PM, 28 November 2017)

Which statement(s) is(are) true about the following sequence $s_0 = 1$ and $s_n = 1 - e^{-s_{n-1}}$

Select the correct option

- | | |
|----------------------------------|--|
| ☐ | $0 < s_n \leq 1$ for all n . |
| ☐ | $s_{n+1} - s_n = -(e^{-s_n} - e^{-s_{n-1}})$. |
| ☐ | Sequence is convergent. |
| ☒ | All of the above. |



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MTH621: Quiz 2

Question # 4 of 10 (Start time: 02:09:40 PM, 28 November 2017)

Identify the identical sequences.

Select the correct option

☐	$\left\{ \frac{1}{n^2-2} \right\}_3^\infty$ and $\left\{ \frac{1}{n} \right\}_1^\infty$.
☐	$\left\{ \frac{1}{n} \right\}_3^\infty$ and $\left\{ \frac{1}{n} \right\}_1^\infty$.
☐	$\left\{ \frac{1}{n-2} \right\}_3^\infty$ and $\left\{ \frac{1}{n^3} \right\}_1^\infty$.
☒	$\left\{ \frac{1}{n-2} \right\}_3^\infty$ and $\left\{ \frac{1}{n} \right\}_1^\infty$.



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MTH621: Quiz 2

Question # 2 of 10 (Start time: 02:07:17 PM, 28 November 2017)

If the sequence is increasing, then it

▶ Select the correct option

- | | | | |
|-----------------------|--------------------------------|---|---|
| ☐ | converges to its supremum. |   | A |
| ☐ | diverges. | | |
| ☐ | may converges to its supremum. | | |
| ☐ | is bounded. | | |

MTH621:Quiz 2

Question # 7 of 10 (Start time: 02:12:09 PM, 28 November 2017)

The series $\sum_{n=0}^{\infty} r^n$, $-1 < r < 1$, is

Select the correct option

☒	divergent.
☐	convergent and converges to $\frac{1}{1+r^2}$.
☐	convergent and converges to 5.
☐	convergent and converges to $\frac{1}{1-r}$.



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MTH621: Quiz 2

Question # 8 of 10 (Start time: 02:13:27 PM, 28 November 2017)

The set of terms of $\{s_{n_k}\}$ is contained in the set of terms of $\{s_n\}$ implies

Select the correct option

- | | |
|----------------------------------|-------------------------------------|
| ☐ | $\sup\{s_n\} = \sup\{s_{n_k}\}.$ |
| ☐ | $\sup\{s_n\} \leq \sup\{s_{n_k}\}.$ |
| ☒ | $\sup\{s_n\} \geq \sup\{s_{n_k}\}.$ |
| ☐ | $\{s_n\}$ is convergent. |



Pg38



Question # 6 of 10 (Start time: 08:56:23 PM, 30 November 2017)

If $\{x_n\}$ converges to -1 and $\{t_n\}$ converges to 5 , then the sequence $\{x_n + t_n\}$

Select the correct option

- | | |
|----------------------------------|--|
| ☐ | will be divergent. |
| ☐ | will be convergent and its limit is 5 . |
| ☒ | will be convergent and its limit is 4 . |
| ☐ | may be convergent and may be divergent, it depends on the particular given sequences $\{x_n\}$ and $\{t_n\}$. |



Pg34

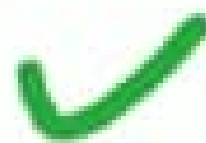


Question # 2 of 10 (Start time: 08:54:27 PM, 30 November 2017)

Which statement(s) is(are) true for the following sequence $\{\sqrt[n]{n}\}$

Select the correct option

☐	The sequence is divergent.
☒	The sequence is convergent and converges to 1.
☐	The sequence is convergent and converges to 0.
☐	The sequence is divergent to ∞ .



Question # 8 of 10 (Start time: 08:57:41 PM, 30 November 2017)

The value of the $\lim_{n \rightarrow \infty} \frac{1}{n^p}$ is

Select the correct option

- | | |
|----------------------------------|---|
| ☒ | $\lim_{n \rightarrow \infty} \frac{1}{n^p} = 0$ for $p > 0$. |
| ☐ | $\lim_{n \rightarrow \infty} \frac{1}{n^p} = 3$ for all p . |
| ☐ | $\lim_{n \rightarrow \infty} \frac{1}{n^p} = 1$ for all p . |
| ☐ | $\lim_{n \rightarrow \infty} \frac{1}{n^p} = 1$ for all $p > 1$. |



Question # 5 of 10 (Start time: 08:56:02 PM, 30 November 2017)

$$S = (2, 4) \cup (5, 6)$$

is

Select the correct option

☐	compact
☐	closed
☒	open
☐	semi infinite



MTH621 Quiz 2

Question # 4 of 10 (Start time: 08:55:16 PM, 30 November 2017)

If the sequence is convergent then

Select the correct option



it has two limits.



it is bounded



it is bounded above but may not be bounded below



it is bounded below but may not be bounded above

Question # 6 of 10 (Start time: 10:21:25 PM, 14 February 2020)

Generalized Mean Value Theorem says, If f and g are continuous on the closed interval $[a, b]$ and differentiable on the

Select the



Pg112

for some c in (a, b) .

$$[g(b) - g(a)]f'(c) = [f(b) - f(a)]g'(c)$$

for some c in (a, b) .

$$[g(b) - g(a)] = [f(b) - f(a)]g'(c)$$

 $g'(x) = 0$ for all x in (a, b) . $g'(x) = f'(x)$ for all x in (a, b) .

The value of $x + \lim_{x \rightarrow 0+} \frac{|x|}{x} =$

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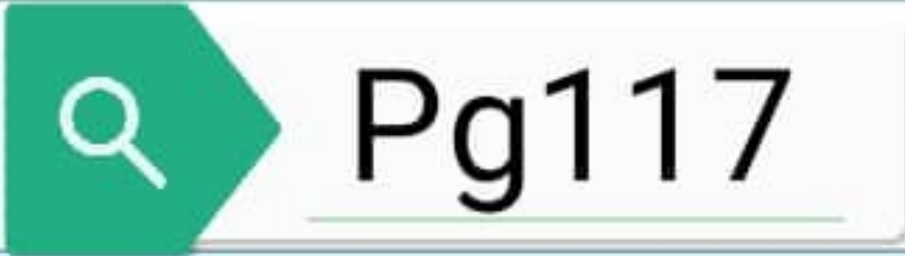
Select the correct option

☐		$x - 1.$
☒	 Pg81 	$x + 1.$
☐		$x.$
☐		$x + 1/x.$

The value of the limit

$$\lim_{x \rightarrow 0^+} x \log x,$$

Select the correct option

☒	0		 AHMAD MSC(MATH) Areeb2113@gmail.com
☐	1		
☐	2		
☐	3		

If $\lim_{x \rightarrow 0} f(x) = 10$ and $\lim_{x \rightarrow 0} g(x) = -2$ then $\lim_{x \rightarrow 0} \left(\frac{f(x)}{g(x)} \right)$ is

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Select the correct option



-10.



5.



0.



-5.



If $f(x) = \log x$ and $g(x) = \frac{1}{1-x^2}$, then $f \circ g$ is

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Select the correct option

☒ $(f \circ g)(x) = \log \frac{1}{1-x^2}.$



Pg99



☐ $(f \circ g)(x) = \log \frac{x}{1-x^2}.$

☐ $(f \circ g)(x) = \log \frac{1}{x^2}.$

☐ $(f \circ g)(x) = \log \frac{-1}{1-x^2}.$

The $\lim_{x \rightarrow 2} (3x - 5) =$

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Select the correct option

☐	0.
☒	1.
☐	-1.
☐	-2.



Pg87



The limit

$$\lim_{x \rightarrow \infty} x^2 - x.$$

is

Select the correct option

☒	does not exist.			Pg118	<i>AHMAD MSC(MATH)</i> <i>Areeb2113@gmail.com</i>
☐	2.				
☐	0.				
☐	6.				

For the function defined as

$$f(x) = cx,$$

for every $\epsilon > 0$ the formal definition ensures

Select the correct option



$$|f(x) - cx_0| < \epsilon, \quad |x - x_0| < \delta, \text{ where } 0 < \delta < \epsilon.$$

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$$|f(x) - cx_0| < \epsilon, \quad |x - x_0| < \delta, \text{ where } 0 < \delta < \epsilon/|c|.$$



Pg78



$$|f(x) - cx_0| < \epsilon, \quad |x - x_0| < \delta, \text{ where } -\epsilon < \delta < \epsilon.$$



$$|f(x) - cx_0| < \epsilon, \quad |x - x_0| < \delta, \text{ where } 0 < \delta < \epsilon.$$

Question # 8 of 10 (Start time: 10:19:34 PM, 14 February 2020)

$\lim_{x \rightarrow 0^+} x \log x$, has the following indeterminate form

Select the correct option

☐	$\infty \times \infty$.
☒	$(0)(\infty)$.
☐	$\frac{0}{0}$.
☐	0^∞ .



Pg117



The $\lim_{x \rightarrow 0} \frac{4 - 4 \cos x - 2 \sin^2 x}{x^4}$ is

Select the correct option

☐	$\frac{1}{4}$
☐	$-\frac{1}{2}$
☒	$\frac{1}{2}$
☐	2



Pg116



The limit

$$\lim_{x \rightarrow 1} \sqrt{x} - 1.$$

Select the correct option



1.

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0.



B



does not exist.



-1.

For the function $f(x) = x \sin \frac{1}{x}$, $x \neq 0$, which statement is true

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Select the correct option



$$\lim_{x \rightarrow 1/\pi} f(x) = 0.$$



The function is not defined at

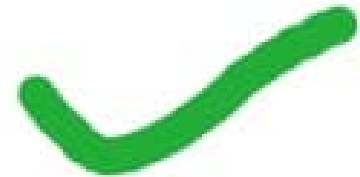
$$x = 0.$$



$$\lim_{x \rightarrow 0} f(x) = 1.$$



Pg78



$$\lim_{x \rightarrow 0} f(x) = 0.$$

For the piecewise defined function $f(x) = \begin{cases} x^3, & x \leq 0, \\ x^2 \sin \frac{1}{x}, & x > 0, \end{cases}$

$$\begin{cases} x^3, & x \leq 0, \\ x^2 \sin \frac{1}{x}, & x > 0, \end{cases}$$

Select the correct option

☒	0	 Pg108 	AHMAD MSC(MATH, Areeb2113@gmail.com
☐	2		
☐	1		
☐	-1		

The value of

$$\lim_{x \rightarrow +\infty} \frac{e^x}{x^2}$$

elect the correct option

☐	0
☐	$-\infty$
☒	∞
☐	3



Pg116



For the function $\frac{|x|}{x}$, identify the false statement(s)

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Select the correct option

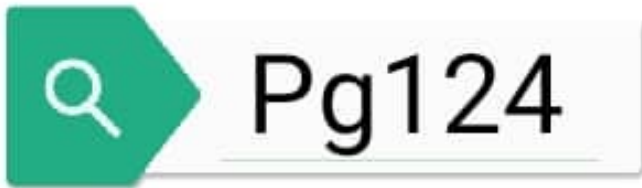
☐	$\lim_{x \rightarrow 0^+} \frac{ x }{x} = 1$
☐	$\lim_{x \rightarrow 0^-} \frac{ x }{x} = -1$
☐	$\lim_{x \rightarrow 0} \frac{ x }{x}$ doesn't exist.
☒	$\lim_{x \rightarrow 0} \frac{ x }{x} = 1$

MTH621:Quiz-2

Question # 3 of 10 (**Start time: 06:37:57 PM, 04 August 2021**)

Investigate the limit of $\lim_{x \rightarrow 0} \frac{\sin x}{x} = \text{--- -- --}$.

Select the correct option

☒	1		
☐	0		
☐	<i>none of these</i>		
☐	x		

MTH621:Quiz-2

Question # 8 of 10 (**Start time: 06:39:11 PM, 04 August 2021**)

If f is differentiable at a local extreme point $x_0 \in D_f^0$, then

Select the correct option

- | | |
|----------------------------------|-------------------|
| ☐ | $x_0 = 0.$ |
| ☒ | $f'(x_0) = 0.$ |
| ☐ | $ f'(x_0) < 0.$ |
| ☐ | $f'(x_0) \neq 0.$ |



Pg110



MTH621:Quiz-2

Question # 10 of 10 (**Start time: 06:39:37 PM, 04 August 2021**)

The inverse of the given function $f(x) = 2x + 4$, $0 \leq x \leq 2$, is

Select the correct option



$$f^{-1}(y) = \frac{x-2}{4}.$$



$$f^{-1}(y) = \frac{y-4}{2}.$$



Pg101



$$f^{-1}(y) = \frac{y-2}{4}.$$



$$f^{-1}(y) = \frac{y-4}{4}$$

MTH621:Quiz-2

Question # 3 of 10 (**Start time: 06:41:31 PM, 04 August 2021**)

Which function has $0/0$ form

Select the correct option

☐	$f(x) = 2 \ln x$ at $x = 2$.
☒	$f(x) = \frac{\sin \pi x}{x-1}$ at $x = 1$.  B
☐	$f(x) = \frac{e^{-x}}{x}$ at $x = 2$
☐	$f(x) = \cos x + x$ at $x = 0$.

MTH621:Quiz-2

Question # 4 of 10 (**Start time: 06:41:42 PM, 04 August 2021**)

The derivative of the function x^n is

Select the correct option

☐	$nx^n.$
☐	$x^{n-1}.$
☐	$\frac{n}{x^{n-1}}.$
☒	$nx^{n-1}.$



Pg103



Question # 5 of 10 (Start time: 06:41:55 PM, 04 August 2021)

The Mean Value Theorem says, suppose that f is differentiable on $[a, b]$, $f'(a) \neq f'(b)$, and μ is between $f'(a)$ and $f'(b)$.

Select the correct option

- | | |
|----------------------------------|---|
| ☒ | Then $f'(c) = \mu$ for some c in (a, b) . |
| ☐ | Then $f'(c) \neq \mu$ for some c in (a, b) . |
| ☐ | Then $f'(c)$ may be 0 or μ for some c in (a, b) . |
| ☐ | Then $f'(c) = 0$ for some c in (a, b) . |



Pg111



MTH621:Quiz-2

Question # 9 of 10 (**Start time: 06:43:17 PM, 04 August 2021**)

The inverse of the function $f(x) = x^2$, is

Select the correct option

☐	$f^{-1}(y) = y^2$
☐	$f^{-1}(y) = \frac{1}{x^2}$
☐	$f^{-1}(y) = \frac{1}{y^2}$
☒	$f^{-1}(y) = \sqrt{y}.$



Pg101



Question # 2 of 10 (Start time: 06:46:23 PM, 04 August 2021)

The function $g(x) = x^2$ is

Select the correct option

- | | |
|----------------------------------|---|
| ☐ | undefined on $[0, \infty)$. |
| ☐ | decreasing on $[0, \infty)$. |
| ☒ | increasing on $[0, \infty)$. |
| ☐ | having negative values on $[0, \infty)$. |



Pg97



MTH621:Quiz-2

Question # 3 of 10 (Start time: 06:46:37 PM, 04 August 2021)

Investigate the limit of $\lim_{x \rightarrow 0^-} \left(\frac{|x|}{x} + x \right) = \text{--- --}$.

Select the correct option

☐	1
☐	none of these
☒	-1
☐	0



Pg82



Question # 4 of 10 (Start time: 06:46:48 PM, 04 August 2021)

The series $\sum a_n b_n$ converges if $a_{n+1} \leq a_n$ for $n \geq k$, $\lim_{n \rightarrow \infty} a_n = 0$, and $|b_k + b_{k+1} + \dots + b_n| \leq M$, for some constant M .

Select the correct option

☐	<
☒	<div> Pg61 </div>
☐	$\leq$
☐	>

MTH621:Quiz-2

Question # 1 of 10 (**Start time: 08:14:09 PM, 04 August 2021**)

Investigate the limit of $\lim_{x \rightarrow 0} x \sin \frac{1}{x} = \text{--- --}$.

Select the correct option

☐	<i>none of these</i>
☒	0
☐	<i>x</i>
☐	1



Pg78&pg108



Question # 9 of 10 (**Start time: 08:15:58 PM, 04 August 2021**)

Investigate the limit of $\lim_{x \rightarrow 0^-} \frac{1}{x} = - - -$.

Select the correct option

☐	<i>none of these</i>
☒	$-\infty$  Pg84 
☐	∞
☐	0

Question # 6 of 10 (Start time: 06:47:13 PM, 04 August 2021)

Investigate the limit of $\lim_{x \rightarrow 0} 2x \sin \sqrt{x} = \text{--- --}$.

Select the correct option

- | | |
|----------------------------------|----------------------|
| ☐ | <i>none of these</i> |
| ☒ | 0 |
| ☐ | 1 |
| ☐ | x |

Topic 108,
pg80_81

MTH621:Quiz-2

Question # 2 of 10 (**Start time: 08:14:26 PM, 04 August 2021**)

If a function f is continuous on the closed interval then f attains its

Select the correct option

☒	extreme values in the closed interval.	
☐	may or may not attain extreme values in the closed interval.	
☐	derivative in the closed interval.	
☐	extreme values at one point in the closed interval.	

MTH621:Quiz-2

Question # 3 of 10 (**Start time: 08:14:39 PM, 04 August 2021**)

If $f : I \rightarrow \mathbb{R}$ has a derivative at $c \in I$, then f is

Select the correct option

☐	having one sided limit.
☒	continuous at c.
☐	discontinuous at c.
☐	undefined at c.

MTH621:Quiz-2

Question # 4 of 10 (**Start time: 08:14:50 PM, 04 August 2021**)

Investigate the limit of $\lim_{x \rightarrow 0^+} \left(\frac{|x|}{x} + x \right) = \text{--- --}$.

Select the correct option

☐	0
☐	none of these
☐	-1
☒	1



Pg82



Question # 5 of 10 (Start time: 08:15:02 PM, 04 August 2021)

Total Marks: 1

Rolle's Theorem says, suppose that f is continuous on the closed interval $[a, b]$ and differentiable on the open interval (a, b) and $f(a) = f(b)$.

Select the correct option

[Reload Math Equations](#)

Then $f'(c) = 0$ for some c in the open interval (a, ∞) .



Then $f'(c) \neq 0$ for some c in the open interval (a, b) .



Then $f'(c) = 0$ for some c in the open interval (a, b) .



Then $f'(c)$ exists for some c in the open interval (a, b) .



Pg 111



Question # 6 of 10 (**Start time: 08:15:16 PM, 04 August 2021**)

The function $h(x) = -x^3$ is

Select the correct option

- | | |
|----------------------------------|---------------------------------------|
| ☐ | is undefined on $(-\infty, \infty)$. |
| ☒ | decreasing on $(-\infty, \infty)$. |
| ☐ | increasing on $(-\infty, \infty)$. |
| ☐ | positive on $(-\infty, \infty)$. |



Pg 97

Question # 7 of 10 (Start time: 08:15:30 PM, 04 August 2021)

The series $\sum a_n b_n$ converges if $a_{n+1} \leq a_n$ for $n \geq k$, $\lim_{n \rightarrow \infty} a_n = \text{--- -- --}$, and $|b_k + b_{k+1} + \dots + b_n| \leq M$, for some constant M .

Select the correct option

☐	-1
☒	0
☐	None of these
☐	1



Pg61



Question # 8 of 10 (Start time: 08:15:43 PM, 04 August 2021)

The function $f(x) = \begin{cases} x, & 0 \leq x < 1, \\ 2, & 1 \leq x \leq 2, \end{cases}$ is

Select the correct option

☐	is nonincreasing on	$I = [0, 2]$.
☐	is having negative values on	$I = [0, 2]$.
☒	is nondecreasing on	$I = [0, 2]$. ✓
☐	is undefined on	$I = [0, 2]$.

Question # 10 of 10 (Start time: 08:16:14 PM, 04 August 2021)

The function $g(x) = -x^3$ is decreasing on -----.

Select the correct option

- | | |
|----------------------------------|---------------------|
| ☐ | none of these |
| ☐ | $(-\infty, 0)$ |
| ☒ | $(-\infty, \infty)$ |
| ☐ | $[0, \infty)$ |



Pg 97

