Mth621

*Appreciation of e

*Square root of 8 is irrational

*Alternative series def +example

* 2 question for proof

Past papers sy Mcqs ahy tha

9:41 AM

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Math621

1.define power series

2.convergence test ka question tha

3.prove n,underroot n =1

4.monotonic sequence ka theorm tha

5. cauchy convergence criterion ka theorm tha

Ik or theorm tha , baqi. 7 MCqs ahmad file sy thy

12:29 P

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MTH621 paper
Q1: State completeness property of R
Q2: Cauchy convergence criterion
Q3: convergence test ka 1 question
Q4: open cover of [0,1]
Q5: proof tha chota sara sequesce k topic se
Q6: Rabee test ka question tha

.

MCQs sary Ahmad ki file se thy, mtlb wo 20 k 20 mery theek hen🙈

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MTH 621 MID Term Paper 30/12/2018

Q No1) If $x \in R$, $y \in R$ and $x < y$ then there exist $p \in Q$ such that $x < p < y$. (5 marks)

Q No2)

$$\sum a_n = \sum \frac{n!}{\alpha(\alpha+1)\ldots(\alpha+n-1)}, \quad \alpha > 0 \longrightarrow (5 \text{ marks})$$

Check Series Convergence or not by Raabe's test.

Q No3) Define Ratio test. (3 marks)

Q No4) $\sum \frac{x^n}{n!}$ Find Radius of Convergence. (3 marks)

Q No5) $\sum \frac{x^n}{n^{(n-n^2)}}$ Sequence check Cgs or dgs (2 mar

Q No6) Let $S = (-\infty, -1] \cup (1,2) \cup \{3\}$
Then the set of limit points of S is $(-\infty, -1] \cup [1,2]$. (2 marks)

Good Luck

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MTH 621 paper

Questions:

1. Suppose that f is differentiable on $[a,b]$, $f'(a) \neq f'(b)$ and y is b/n $f'(a)$ and $f'(b)$. Then $f'(c) = y$ for some c in (a,b)

Proof: karna tha 5-Marks

2. proofe Generalize Mean Value thrm

5-Marks

3. If f is continous on $[a,b]$ then f is integrable on $[a,b]$

4- Define Upper Integral?

5- Determine f is integrable on $\frac{1+x}{1}$

6- If f is differenticable at x_0 the

f is continous

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1. Discuss

8. Def

7. Discuss the continuity of

$$\begin{cases} x+1 & \text{if } x \geq 0 \\ x-1 & \text{if } x \leq 0 \end{cases} \quad \text{at } x=0$$

8. Define Dirichlet's Test

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$$\sum_{n\to 2}^{\infty} \frac{\sin n\theta}{n+(-1)^n} \quad \theta \neq 1 < n.$$

Q14 Is $\left(\frac{1}{n}+n^2\right)$ bounded?

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ABEL's Test

Series $\sum a_n b_n$ converges.

if $a_{n+1} \leq a_n$ For $n \geq k$

$\lim_{n\to\infty} a_n = 0$ and

$|b_k + b_{k+1} \cdots b_n| \leq M, \; n \geq k$

MID - 2018, MTH621

Q#1:- Cauchy convergence criterion -(5)

Q#2:- $\sqrt{8}$ is alway irrational number :(5)

Q#3:- Show that $(n - n^2)$ converges or diverges. (2)

Q#3:- Give an example of subsequence which does not converges but its subsequence does converges: (3)

Q#4:- $S \subseteq (-\infty, -1) \cup (1,2) \cup (3)$ give all set limit points of S. (3)

Q#5:- $\{S_n\} = \left\{\frac{1}{n}\right\} = \left\{1 + \frac{1}{2}, \frac{1}{3}, \dots\right\}$ write subsequence :- (2)

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Mth621 my today's paper
1) state convergence sequence
2)is irrational is countable
3)check convergence of series Long
4) sqrt 8 is irrational prove
5) prove "e"

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Mth621
Mcqs conceptual thy
Infimum definition
Series power
Bounded sequence thrm tha...
Underroot 8 rational hai yh prove krna tha 5 marks
RABEES TEST 5 marks

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Mth621
Write any subsequence of seque $1/n^2$
2marks

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Define infimum 2marks
Discuss series con or div (n/2+1/n)
3marks

Cauch'y criterion state and proof 5
Aik therom tha koi yad nai wo b 5 ka
tha

12:34 PM

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MTH 621

Mcqs were v.tough and only two mcqs from quiz.

1) Sequence Given thi uski Limit find krni thi. (2)

2) Power Series def. (2)

3) Pove that Convergent Series is bounded. (3)

4) Define Limit inferior for S_n. (3)

5) Find the approximation of e. (5

6) Principle of mathematical induction se 1 question. (5)

Question # 1 of 10 (Start time: 08:10:51 PM, 07 November 2017)

Which one is not an initial segment of $\mathbb{N}$

Select the correct option

○	$\{1, 2, 3, \ldots, 30\}$.
○	$\{1, 2, 3, \ldots, 100, 101, 102, 103\}$.
○	$\{1, 2, 3\}$.
●	$\{2, 4, 6\}$.

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Question # 2 of 10 (Start time: 08:11:21 PM, 07 November 2017)

The supremum of the set $B = \{p \in \mathbb{Q} : p^2 < 3\}$ is

Select the correct option

○	$\sqrt{2}$.
○	$\sqrt{3}$.
○	10.
○	19.

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Question # 3 of 10 (Start time: 08:12:24 PM, 07 November 2017)

The union of set of rational numbers and the set of irrational numbers is

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Select the correct option

○	The set $\{n \in \mathbb{Q} : x^7 - 10x + 30 = 0\}$.
○	The set of integers.
○	The set of natural numbers.
●	$\mathbb{R}$, the set of real numbers.

MTH621:Quiz 1

Question # 4 of 10 (Start time: 08:13:00 PM, 07 November 2017)

The supremum of the set $E_2 = \{1/n \ : n \in \mathbb{N}\}$ is

Select the correct option

○	5
●	1
○	7
○	4

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Question # 5 of 10 (Start time: 08:13:37 PM, 07 November 2017)

Identify the false statement(s)

Select the correct option

- ○ The set of natural numbers is not complete.
- ○ The set of rational numbers is complete
- ○ The set of rational numbers is an infinite set.
- ○ The set of real numbers is complete.

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Question # 6 of 10 (Start time: 08:14:46 PM, 07 November 2017)

The infimum of set of integers is

Select the correct option

○	$-\infty$.
●	∞ .
○	-100 .
○	10 .

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Question # 7 of 10 (Start time: 08:15:55 PM, 07 November 2017)

The statement(s) true about the real number $4\sqrt{10}$ is(are)

Select the correct option

- ○ is a rational number.
- ● an irrational number.
- ○ the solution of $x^2 - 2x + 3$.
- ○ the solution of $x^2 - 4 = 0$.

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Question # 8 of 10 (Start time: 08:17:10 PM, 07 November 2017)

Which statement(s) is(are) true

Select the correct option

○	The set of even numbers is defined as $\{2k-1 : k \in \mathbb{N}\}$.
○	The set of odd numbers is defined as $\{2k : k \in \mathbb{N}\}$.
○	Both set of even numbers and set of odd numbers are countable.
○	The set of even numbers is a finite set.

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Question # 9 of 10 (Start time: 08:18:14 PM, 07 November 2017)

Which set is dense in the of real number

Select the correct option

○	The set of integers.
●	The set of rational numbers.
○	The set $[0, 1]$.
○	All of the above.

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Question # 10 of 10 (Start time: 08:19:14 PM, 07 November 2017)

Which one is an irrational number

Select the correct option

○	$\frac{22}{7}$.
●	π.
○	$\frac{p+q}{pq}$, where p, q are nonnegative integers.
○	$\sqrt{s}$, where s is a perfect square.

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Question # 1 of 10 (Start time: 10:45:18 PM, 16 May 2018)

Which statement is true about the sets $\mathbb{N}$ and $\mathbb{Q}$

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Select the correct option

○	$\mathbb{N} = \mathbb{Q}$
○	$\mathbb{Q} \subset \mathbb{N}$.
●	$\mathbb{N} \subset \mathbb{Q}$.
○	None of the above.

Click t

Which statement(s) is(are) true

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Select the correct option

○	The set of even numbers is defined as $\{2k-1 : k \in \mathbb{N}\}$.
○	The set of odd numbers is defined as $\{2k : k \in \mathbb{N}\}$.
●	Both set of even numbers and set of odd numbers are countable.
○	The set of even numbers is a finite set.

The supremum of the set $E_2 = \{1/n : n \in \mathbb{N}\}$ is

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Select the correct option

○	5
●	1
○	7
○	4

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The supremum of the set $B = \{p \in \mathbb{Q} : p^2 < 3\}$ is

Select the correct option

○	$\sqrt{2}$.
●	$\sqrt{3}$.
○	10.
○	19.

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The union of set of rational numbers and the set of irrational numbers is

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Select the correct option

○	The set $\{n \in \mathbb{Q} : x^7 - 10x + 30 = 0\}$.
○	The set of integers.
○	The set of natural numbers.
●	$\mathbb{R}$, the set of real numbers.

The infimum of the set $E_2 = \{1/n : n \in \mathbb{N}\}$ is

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Select the correct option

○	-1.
○	2.
○	-3.
●	0.

The statement(s) true about the real number $4\sqrt{10}$ is(are)

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Select the correct option

○	is a rational number.
●	an irrational number.
○	the solution of $x^2 - 2x + 3$.
○	the solution of $x^2 - 4 = 0$.

The intersection of set of odd numbers and the set of even numbers is

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Select the correct option

○	The set of rational numbers.
●	The empty set.
○	$\{1,2,3,4\}$.
○	The set of real numbers.

Question # 10 of 10 (Start time: 10:49:12 PM, 16 May 2018)

Identify the false statement(s)

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Select the correct option

- ○ The set of natural numbers is not complete.
- ○ The set of rational numbers is complete
- ● The set of rational numbers is an infinite set.
- ○ The set of real numbers is complete.

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

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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.

$\limsup_{n\to\infty} s_n = \infty$ if

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

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

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

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Select the correct option

○	$\sup\{s_n\} = \sup\{s_{n_k}\}$.
○	$\sup\{s_n\} \leqslant \sup\{s_{n_k}\}$.
●	$\sup\{s_n\} \geqslant \sup\{s_{n_k}\}$.
○	$\{s_n\}$ is convergent.

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

Every Cauchy sequence has a

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Select the correct option

- (●) convergent subsequence.
- ( ) increasing subsequence.
- ( ) decreasing subsequence.
- ( ) positive subsequence.

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

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Question # 1 of 10 (Start time: 09:45:42 PM, 30 November 2017)

If $p > 0$ and α is real, then value of the

$$\lim_{n\to\infty} \frac{n^{\alpha}}{(1+p)^{n}},$$

Select the correct option

○	∞.
○	3.
○	2.
●	0.

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Question # 2 of 10 (Start time: 09:46:35 PM, 30 November 2017)

The value of the

$$\lim_{n\to\infty} \frac{1}{n^p}$$

Select the correct option

- (●) $\lim_{n\to\infty} \frac{1}{n^p} = 0$ for $p > 1$.
- ( ) $\lim_{n\to\infty} \frac{1}{n^p} = 3$ for all p.
- ( ) $\lim_{n\to\infty} \frac{1}{n^p} = 1$ for all p.
- ( ) $\lim_{n\to\infty} \frac{1}{n^p} = 1$ for $p > 1$.

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Question # 3 of 10 (Start time: 09:47:35 PM, 30 November 2017)

If the sequence is convergent then

Select the correct option

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- ○ 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.

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

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Select the correct option

- ○ $0 < s_n \leqslant 1$ 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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The series $\sum_{n=0}^{\infty} r^n, \quad -1 < r < 1$, 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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Question # 6 of 10 (Start time: 05:45:14 P.M. 30 November 2017)

Which sequence is bounded

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Select the correct option

- $s_n = [1 + (-1)^n]n.$
- $\{(-1)^n\}.$
- $\{n\}.$
- $\{\frac{1}{n} + n^2\}.$

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Question # 7 of 10 (Start time: 09:50:00 PM, 30 November 2017)

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

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Select the correct option

- (●) $\lim_{n\to\infty} \frac{1}{n^p} = 0$ for $p > 0$.
- ( ) $\lim_{n\to\infty} \frac{1}{n^p} = 3$ for all p.
- ( ) $\lim_{n\to\infty} \frac{1}{n^p} = 1$ for all p.
- ( ) $\lim_{n\to\infty} \frac{1}{n^p} = 1$ for all $p > 1$.

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Every Cauchy sequence has a

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Select the correct option

- (●) convergent subsequence.
- ( ) increasing subsequence.
- ( ) decreasing subsequence.
- ( ) positive subsequence.

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

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Select the correct option

○	The sequence is oscillatory.
●	The sequence converges to 1.
○	The sequence converges to 0.
○	The sequence is divergent to

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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)

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The supremum of the set $B = \{p \in \mathbb{Q} : p^2 < 3\}$ is

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Reload Math Equations

○	$\sqrt{2}$.
●	$\sqrt{3}$.
○	10.
○	19.

Click to Save Answer & Move to Next Question

Which one is not an initial segment of $\mathbb{N}$

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Reload Math Equations

- $\{1, 2, 3, \ldots, 30\}$.
- $\{1, 2, 3, \ldots, 100, 101, 102, 103\}$.
- $\{1, 2, 3\}$.
- $\{2, 4, 6\}$.

Click to Save Answer & Move to Next Question

The statement(s) true about the real number $4\sqrt{10}$ is(are)

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Reload Math Equations

○	is a rational number.
●	an irrational number.
○	the solution of $x^2 - 2x + 3$.
○	the solution of $x^2 - 4 = 0$.

Click to Save Answer & Move to Next Question

Identify the false statement(s)

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Select the correct option

- ○ The set of natural numbers is not complete.
- ● The set of rational numbers is complete
- ○ The set of rational numbers is an infinite set.
- ○ The set of real numbers is complete.

Click to Save Answer & Move to Next Question

Question # 6 of 10 (Start time: 11:10:14 PM, 13 May 2018

The infimum of set of integers is

Select the correct option

- $-\infty$.
- ∞ .
- -100 .
- 10 .

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MTH621:Quiz 1

Question # 6 of 10 (Start time: 08:49:50 PM, 14 May 2018)

The supremum of a set is

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Select the correct option

- not unique.
- the greatest upper bound of that set.
- least upper bound.
- None of the above.

Question # 3 of 10 (Start time: 11:14:15 PM, 13 May 2011

The infimum of the set $B = \{p \in \mathbb{Q} : p^2 > 2\}$ is

Select the correct option

○	$\sqrt{2}$.
○	$\sqrt{10}$.
○	$\sqrt{5}$.
○	1.

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Question # 3 of 10 (Start time: 11:14:12 PM, 13 May 2018)

The infimum of the set $B = \{p \in \mathbb{Q} : p^2 > 2\}$ is

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Select the correct option

○	$\sqrt{2}$
○	$\sqrt{10}$
○	$\sqrt{5}$
○	3

Question # 3 of 10 (Start time: 08:31:17 PM, 14 Ma

The infimum of the set $E_2 = \{1/n \ : n \in \mathbb{N}\}$ is

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Selec

○	-1.
○	2.
○	-3.
●	0.

Identify the countable set

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Select the correct option

○	The set of irrational numbers.
○	The interval $[0, 1]$.
○	$\mathbb{N} \times \mathbb{N}$.
○	The interval $[1, 2]$.

Question # 3 of 10 (Start time: 08:47:49 PM, 14 May 2018)

Identify the false statement(s)

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Select the correct option

- ○ The set of natural numbers is not complete.
- ○ The set of rational numbers is complete
- ○ The set of rational numbers is an infinite set.
- ● The set of real numbers is complete.

Click to Save Answer & Move

Question # 5 of 10 (Start time: 08:49:25 PM, 14 May 2018)

The intersection of set of odd numbers and the set of even numbers i

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Select the correct option

○	The set of rational numbers.
●	The empty set.
○	$\{1, 2, 3, 4\}$.
○	The set of real numbers.

quiz.vu.edu.pk/QuizQuestion.asp?

MC170400773: HUMA JAVED

MTH621:Quiz 1

Question # 5 of 10 (Start time: 08:32:36 PM, 14 May 2018)

The union of set of rational numbers and the set of irrational numbers is

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Select the correct option

○	The set $\{n \in \mathbb{Q} : x^7 - 10x + 30 = 0\}$.
○	The set of integers.
○	The set of natural numbers.
○	$\mathbb{R}$, the set of real numbers.

Question # 4 of 10 (Start time: 08:49:12 PM, 14 May 2018)

The supremum of the set $B = \{p \in \mathbb{Q} : p^2 < 3\}$ is

Select the correct option

○	$\sqrt{2}$.
○	$\sqrt{3}$.
○	10.
○	19.

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MTH621:Quiz 1

Question # 7 of 10 (Start time: 08:34:21 PM, 14 May 2018)

The sum of a rational number and an irrational number is

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Select the correct option

- may be a rational depends on the numbers.
- always an irrational number.
- always a rational number.
- may be an irrational number depends on the numbers.

Question # 7 of 10 (Start time: 08:34:21 PM, 14 May 2018)

The sum of a rational number and an irrational number is

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Select the correct option

- may be a rational depends on the numbers.
- always an irrational number.
- always a rational number.
- may be an irrational number depends on the numbers.

uestion # 2 of 10 (Start time: 11:13:21 PM, 13 May 2018)

An upper bound for the set $A = \{p \in \mathbb{Q} : p^2 < 2\}$ is

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elect the correct option

- -1
- 0
- 4
- -4

MTH621:Quiz 1

Question # 1 of 10 (Start time: 08:30:27 PM, 14 May 2018)

The supremum of the set $S_2 = \{1/n : n \in \mathbb{N}\}$ is

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Select the correct option

○	5
○	1
○	7
○	4

MTH621:Quiz 1

Question # 3 of 10 (Start time: 08:31:17 PM, 14 May 2018)

The infimum of the set $E_2 = \{1/n \ : n \in \mathbb{N}\}$ is

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Select the correct option

○	-1.
○	2.
○	-3.
●	0.

Question # 2 of 10 (Start time: 08:30:45 PM, 14 May 2018)

An upper bound for the set $A = \{p \in \mathbb{Q} : p^2 < 2\}$ is

Select the correct option

○	-1.
○	0.
●	4.
○	-4.

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Question # 4 of 10 (Start time: 08:31:44 PM, 14 May 2018) Total Marks: 1

Which statement is true about the sets $\mathbb{N}$ and $\mathbb{Q}$

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Select the correct option

Reload Math Equations

- $\mathbb{N} = \mathbb{Q}$
- $\mathbb{Q} \subset \mathbb{N}$
- $\mathbb{N} \subset \mathbb{Q}$
- None of the above

If the sequence is increasing, then it

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Select the correct option

- converges to its supremum.
- diverges.
- may converges to its supremum.
- is bounded.

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

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Select the correct option

- (1,5]
- {1,2,4}
- [0,1]
- (2,3)

Identify the identical sequences.

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