

Question # 4 of 10 (Start time: 06:47:50 AM, 24 August 2018)

The converse of Lagrange's theorem holds for abelian groups.

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Select the correct option

☒	True
☐	False



Question # 2 of 10 (Start time: 06:47:12 AM, 24 August 2018)

The group G is a copy of the group H , if the function

is ———

$$f : G \rightarrow H$$

Select the correct option

☐	homomorphic
☒	isomorphic
☐	onto
☐	bijective



Question # 1 of 10 (Start time: 06:46:44 AM, 24 August 2018)

Let φ be a homomorphism function from group $(G, *)$ to group $(G', \cdot)$. Then, $(\text{Ker } \varphi, *)$ is a normal subgroup of $(G, *)$.

Select the correct option

☒	True
☐	False

[Click to Save](#)

Question # 9 of 10 (Start time: 06:49:03 AM, 24 August 2018)

Let

$$\phi : G \rightarrow H$$

be a homomorphism, then $\phi(a^{-1}) = \phi(a)^{-1}$ for $a \in G$.

Select the correct option

☒	True
☐	False



Question # 7 of 10 (Start time: 06:48:33 AM, 24 August 2018)

The relation

$\text{mod } H$ is an equivalence relation on G

$$a \equiv b$$

Select the correct option

☒	True
☐	False



Question # 3 of 10 (Start time: 06:47:30 AM, 24 August 2018)

If N is a normal subgroup of $(G, \cdot)$, the set of cosets $G/N = \{Ng | g \in G\}$ forms a group $(G/N, \cdot)$, where the operation is defined by $(Ng_1) \cdot (Ng_2) = N(g_1 \cdot g_2)$. This group is called the quotient group or factor group of G by N .

Select the correct option

☒	True
☐	False

Let $(G, \cdot)$ be a group with subgroup H . For $a, b \in G$, we say $a \equiv b \pmod H$ if and only if $ab^{-1} \in H$.

Select the correct option

☒	True
☐	False

Click to



Question # 10 of 10 (Start time: 06:49:20 AM, 24 August 2018)

Let H be a subgroup of a group G . Then $(aH)(bH) = abH$ is not always true when G is non-abelian.

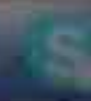
Select the correct option



False



True



The quotient group $\mathbb{R}/\mathbb{Z}$ is isomorphic to the circle group

$$W = \{e^{i\theta} \in \mathbb{C} \mid \theta \in \mathbb{R}\}.$$

Select the correct option

True



False



Click to Save Answer



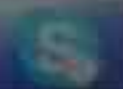
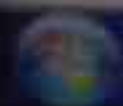
Let ϕ be a homomorphism of a group G into a group G' .
If H is a subgroup of G , then $\phi[H]$ is a subgroup of G' .

Select the correct option

True



False



MC170203385: Maffia Bibi

MTH633:Quiz No. 1

Time Left 71 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 7 of 10 (Start time: 12:27:13 PM, 07 June 2018)

Total Marks: 1

Which of the following is the subgroup of $\{1, -1, i, -i\}$ under multiplication?

Select the correct option

- ☐ $\{1, i\}$
- ☐ $\{1, -i\}$
- ☒ $\{1, -1\}$
- ☐ $\{i, -i\}$

Click to Save Answer & Move to Next Question

MC170203385: Maffia Bibi

MTH633:Quiz No. 1

Time Left 48 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 5 of 10 (Start time: 12:26:05 PM, 07 June 2018)

Total Marks: 1

How many tests are there to show a subset of a group to be a subgroup?

Select the correct option

- ☐ 1
- ☐ 2
- ☒ 3
- ☐ 4

Click to Save Answer & Move to Next Question

MC170203385: Maffia Bibi

MTH633: Quiz No. 1

Time Left 83 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 10 of 10 (Start time: 12:29:50 PM, 07 June 2018)

Total Marks: 1

The order of the group $\{1, \omega, \omega^2\}$ is _____

Select the correct option

Reload Math Equations

- ☐ 2
- ☒ 3
- ☐ 4
- ☐ 5

Click to Save Answer & Move to Next Question

MC170203385: Maffia Bibi

MTH633: Quiz No. 1

Time Left 74 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 2 of 10 (Start time: 12:23:51 PM, 07 June 2018)

Total Marks: 1

The group $(\mathbb{Z}, +)$ is a finite group, where $\mathbb{Z}$ is the set of integers.

Select the correct option

- | | |
|----------------------------------|-------|
| ☐ | False |
| ☒ | True |

Click to Save Answer & Move to Next Question

MC170203385: Maffia Bibi

MTH633: Quiz No. 1

Time Left 44 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 3 of 10 (Start time: 12:24:24 PM, 07 June 2018) Total Marks: 1

A subset H of a group G under addition is a subgroup of G if and only if whenever $a, b \in H$, then $a - b \in H$

Select the correct option

Reload Math Equations

☒	True
☐	False

Click to Save Answer & Move to Next Question

Question # 1 of 10 (**Start time: 03:29:56 PM, 07 June 2018**)

Total Marks: 1

A subset H of a group G under addition is a subgroup of G if and only if whenever $a, b \in H$, then $a - b \in H$

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Select the correct option

 Reload Math Equations

☐	True
☐	False

MC170203385: Maffia Bibi

MTH633: Quiz No. 1

Time Left 71 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 6 of 10 (Start time: 12:26:51 PM, 07 June 2018) Total Marks: 1

A subgroup H of a group $(G, *)$ is a subset of G , which is itself a group under $*$.

Select the correct option

- | | |
|----------------------------------|-------|
| ☒ | True |
| ☐ | False |

Click to Save Answer & Move to Next Question

Question # 6 of 10 (Start time: 03:33:30 PM, 07 June 2018)

Total Marks: 1

Show that $H = \left\{ \begin{pmatrix} 1 & n \\ 0 & 1 \end{pmatrix} \mid n \in \mathbb{Z} \right\}$ is the subgroup of $G = GL(2, \mathbb{R})$ under multiplication.

Select the correct option

 Reload Math Equations

☒	True
☐	False

Click to Save Answer & Move to Next Question

Question # 6 of 10 (Start time: 03:33:30 PM, 07 June 2018)

Total Marks: 1

Show that $H = \left\{ \begin{pmatrix} 1 & n \\ 0 & 1 \end{pmatrix} \mid n \in \mathbb{Z} \right\}$ is the subgroup of $G = GL(2, \mathbb{R})$ under multiplication.

Select the correct option

 Reload Math Equations

☒	True
☐	False

Click to Save Answer & Move to Next Question

Question # 9 of 10 (**Start time: 03:34:33 PM, 07 June 2018**)

Total Marks: 1

The group $(\mathbb{Z}, +)$ is a finite group, where $\mathbb{Z}$ is the set of integers.

Select the correct option

- | | |
|----------------------------------|-------|
| ☒ | False |
| ☐ | True |

Question # 2 of 10 (Start time: 12:39:13 PM, 07 June 2018)

Total Marks: 1

$(\mathbb{Z}, +)$ is the subgroup of $(\mathbb{R}, +)$.

Select the correct option

Reload Math Equations

☒	True
☐	False

Click to Save Answer & Move to Next Question

MC170203385: Maffia Bibi

MTH633: Quiz No. 1

Time Left 44 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 4 of 10 (Start time: 12:25:14 PM, 07 June 2018)

Total Marks: 1

$\langle \{1, -1\}, \cdot \rangle$ is the subgroup of $\langle \{1, -1, i, -i\}, \cdot \rangle$.

Select the correct option

Reload Math Equations

☒	True
☐	False

Click to Save Answer & Move to Next Question

Question # 7 of 10 (Start time: 08:44:47 PM, 08 June 2018)

$\langle \{1, -1\}, \cdot \rangle$ is the subgroup of $\langle \{1, -1, i, -i\}, \cdot \rangle$.

Select the correct option

☒	True
☐	False

Question # 4 of 10 (Start time: 12:52:47 PM, 07 June 2018) Total Marks: 1

$\langle Q, + \rangle$ is the subgroup of $\langle R, + \rangle$.

Select the correct option [Reload Math Equations](#)

☒	True
☐	False

[Click to Save Answer & Move to Next Question](#)

Question # 10 of 10 (Start time: 03:34:48 PM, 07 June 2018) Total Marks: 1

A subset H of a group G is a subgroup of G if and only if H is non-empty and -----

Select the correct option

 Reload Math Equations

- | | |
|-----------------------|--|
| ☐ | whenever $a, b \in H$, then $ab \in H$ |
| ☐ | whenever $a, b \in H$, then $b^{-1} \in H$ |
| ☐ | whenever $a, b \in H$, then $ab^{-1} \in H$ |
| ☐ | whenever $a, b \in H$, then $(ab)^{-1} \in H$ |

MC170202458: Aneeta Shaheen

MTH633:Quiz No. 1

Time Left 65 sec(s)

Quiz Start Time: 12:52 PM, 07 June 2018

Question # 9 of 10 (Start time: 12:54:33 PM, 07 June 2018)

Total Marks: 1

The set of even integers is not a subgroup of the set of integers under the same binary operation of addition.

Select the correct option

- | | |
|----------------------------------|-------|
| ☐ | True |
| ☒ | False |

Click to Save Answer & Move to Next Question

MC170201745: Shakeel Ahmad

MTH633: Quiz No. 1

Time Left 76 sec(s)

Quiz Start Time: 12:39 PM, 07 June 2018

Question # 7 of 10 (Start time: 12:40:53 PM, 07 June 2018)

Total Marks: 1

A non empty subset S of a finite group G is called subgroup of G if and only if ab is in S for all a, b in S .

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Select the correct option

☒	True
☐	False

Click to Save Answer & Move to Next Question

Question # 8 of 10 (Start time: 12:41:33 PM, 07 June 2018) Total Marks: 1

The order of the group $\{1, -1, i, -i, j, -j, k, -k\}$ is -----

- Select the correct option
- ☐ 6
 - ☐ 7
 - ☒ 8
 - ☐ 9

Click to Save Answer & Move to Next Question

Question # 4 of 10 (Start time: 03:32:40 PM, 07 June 2018) Total Marks: 1

The group $(\{1, -1\}, .)$ is subgroup of the group $(\mathbb{Z}, +)$.

Select the correct option

- | | |
|----------------------------------|-------|
| ☒ | True |
| ☐ | False |

Question # 8 of 10 (Start time: 03:34:23 PM, 07 June 2018)

Total Marks: 1

The order of the group $\{1, \omega, \omega^2\}$ is - - - - -

Select the correct option

 Reload Math Equations

- | | |
|-----------------------|---|
| ☐ | 2 |
| ☐ | 3 |
| ☐ | 4 |
| ☐ | 5 |

MC170201745: Shakeel Ahmad

Time Left 38 sec(s)

MTH633:Quiz No. 1

Quiz Start Time: 12:39 PM, 07 June 2018

Question # 9 of 10 (Start time: 12:41:48 PM, 07 June 2018)

Total Marks: 1

The group $[1, -1, i, -i]$ is not a subgroup of itself.

Select the correct option

- | | |
|----------------------------------|-------|
| ☒ | False |
| ☐ | True |

Click to Save Answer & Move to Next Question

MC170201745: Shakeel Ahmad

MTH633:Quiz No. 1

Time Left 82 sec(s)

Quiz Start Time: 12:39 PM, 07 June 2018

Question # 4 of 10 (Start time: 12:40:10 PM, 07 June 2018)

Total Marks: 1

The order of the group $(\mathbb{Z}_6)$ is -----

Select the correct option

- ☐ 0
- ☒ 1
- ☐ 2
- ☐ 3

Click to Save Answer & Move to Next Question

Question # 5 of 10 (**Start time: 03:33:11 PM, 07 June 2018**)

Total Marks: 1

The group $(Q, +)$ is an infinite group, where Q is the set of rational numbers.

Select the correct option

- | | |
|-----------------------|-------|
| ☐ | False |
| ☐ | True |

Question # 5 of 10 (Start time: 03:33:11 PM, 07 June 2018)

Total Marks: 1

The group $(Q, +)$ is an infinite group, where Q is the set of rational numbers.

Select the correct option

- | | |
|-----------------------|-------|
| ☐ | False |
| ☐ | True |

MC170203385: Maffia Bibi

MTH633: Quiz No. 1

Time Left 81 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 1 of 10 (Start time: 12:23:34 PM, 07 June 2018)

Total Marks: 1

In the group $\{1, -1, i, -i\}$, the order of -1 is -----

Select the correct option

- ☐ 1
- ☒ 2
- ☐ 3
- ☐ 4

Click to Save Answer & Move to Next Question

Question # 2 of 10 (Start time: 03:32:01 PM, 07 June 2018)

Total Marks: 1

The group $\{1, -1, i, -i\}$ is a finite group.

Select the correct option

☒	True
☐	False

MC170202458: Aneeta Shaheen

MTH633: Quiz No. 1

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Time Left 75 sec(s)

Quiz Start Time: 12:52 PM, 07 June 2018

Question # 6 of 10 (Start time: 12:53:26 PM, 07 June 2018)

Total Marks: 1

In the group $\{1, -1, i, -i\}$, the order of i is -----

Select the correct option

- | | |
|----------------------------------|---|
| ☐ | 1 |
| ☐ | 2 |
| ☐ | 3 |
| ☒ | 4 |

Click to Save Answer & Move to Next Question

Question # 5 of 10 (Start time: 12:40:25 PM, 07 June 2018) Total Marks: 1

Klein Four group is not cyclic group.

Select the correct option

- ☒ True
- ☐ False

Click to Save Answer & Move to Next Question

MC170203385: Maffia Bibi

MTH633: Quiz No. 1

Time Left 54 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 9 of 10 (Start time: 12:29:09 PM, 07 June 2018) Total Marks: 1

Show that $H = \left\{ \begin{pmatrix} 1 & n \\ 0 & 1 \end{pmatrix} \mid n \in \mathbb{Z} \right\}$ is the subgroup of $G = GL(2, \mathbb{R})$ under multiplication.

Select the correct option

Reload Math Equations

☒	True
☐	False

Click to Save Answer & Move to Next Question

Question # 7 of 10 (Start time: 12:53:45 PM, 07 June 2018)

Total Marks: 1

A subset H of a group G is a subgroup of G if and only if (i) whenever $a, b \in H$, then $ab \in H$ (ii) whenever $b \in H$, then $b^{-1} \in H$

Select the correct option

Reload Math Equations

☒	True
☐	False

Click to Save Answer & Move to Next Question

Question # 6 of 10 (Start time: 08:44:21 PM, 08 June 2018)

A non empty subset S of a finite group G is called subgroup of G if and only if ab is in S for all a, b in S .

Select the correct option

☐	True
☐	False

$\langle \mathbb{Z}, + \rangle$ is the subgroup of $\langle \mathbb{R}, \cdot \rangle$.

Select the correct option

☒	True
☐	False

Question # 9 of 10 (Start time: 08:45:11 PM, 08 June 2018)

The group $(\{1, -1\}, \cdot)$ is subgroup of the group $(\mathbb{Z}, +)$.

Select the correct option

☐	True
☐	False

MC170203385: Maffia Bibi

MTH633: Quiz No. 1

Time Left 24 sec(s)

Quiz Start Time: 12:23 PM, 07 June 2018

Question # 8 of 10 (Start time: 12:27:53 PM, 07 June 2018) Total Marks: 1

The group $(\mathbb{Q}, +)$ is an infinite group, where $\mathbb{Q}$ is the set of rational numbers.

Select the correct option

- | | |
|----------------------------------|-------|
| ☐ | False |
| ☒ | True |

Click to Save Answer & Move to Next Question

The order of the group $\{e\}$ is _____

Select the correct option

☐	0
☐	1
☐	2
☐	3

Question # 3 of 10 (Start time: 03:32:25 PM, 07 June 2018)

Total Marks: 1

The order of the group $\{1, -1\}$ is -----

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Select the correct option

- | | |
|----------------------------------|---|
| ☐ | 1 |
| ☒ | 2 |
| ☐ | 3 |
| ☐ | 4 |

Question # 5 of 10 (Start time: 08:43:47 PM, 08 June 2018)

 $\langle Q, + \rangle$ is the subgroup of $\langle R, + \rangle$.

Select the correct option

☐	True
☐	False

MTH#633
Group Theory

MC170201745
26/06/2018

- ① Define Bijective Mapping 2 Marks
- ② Write identity permutation of D_4 and D_5 2 Marks
- ③ Write Elements of Dihedral Group D_4 3 Marks
- ④ Suppose $G = \langle a \rangle$ with $\langle a \rangle = 30$
Find $|a^{21}|$ and $\langle a^{21} \rangle$ 3 Marks
- ⑤ Show that $(\mathbb{Z}, +)$ is group under addition 5 Marks
- ⑥ Let 'p' be permutation of set 'S'
Then prove following relation is an equivalence relation
$$a \sim b \Leftrightarrow b = p^n(a) \text{ for some } n \in \mathbb{Z}$$

MTH 633

- ① Write 2 ~~ex~~ groups that are abelian.
2 Marks.
- ② Write 2 properties of
Lagrange's Theorem. 2 Marks.
- ③ If $|a| = 30$ then find
 $|a^{21}|$ & $\langle a^{21} \rangle$ 3 Marks.
- ④ If $f: \langle \mathbb{R}, + \rangle \rightarrow \langle \mathbb{R}^+, \cdot \rangle$ then
prove isomorphism. 5 - Marks.
- ⑤ Prove that $\langle \mathbb{R}, + \rangle$ is a group.
5 - Marks.

MTHT 633

- 1) Define bijective mapping? (2) marks
- 2) Write identity of $(S_4, \cdot)$. (2) marks
- 3) Write right cosets of $3\mathbb{Z}$ of $\mathbb{Z}$. (3) marks
- 4) Draw Cayley's table of $\{1, -1, i, -i\}$. (3) marks
- 5) ~~Prove~~ Prove that $\{1, -1, i, -i\}$ is an abelian group? 5 marks
- 6) Prove abelian group upto isomorphism of order 360? 5 marks.

Question # 8 of 10 (Start time: 08:44:59 PM, 08 June 2018)

The order of the group $\{1, -1, i, -i\}$ is _____

Select the correct option

☐

2

☐

3

☒

4

☐

5

Anila



Mth633 mai cosets topicali se
thy

Anila

Aik long qsn tha...
Every subgrp of a cyclic grp is
also cyclic prove krnaa tha
isyyyy



R mcqs mai ziada tr true false
thy r easy he thy

Anila



And one step subgrp and two
step subgrp tasks ko just state
krna thaa



Us MN whole set ko prove krna
tha k ye group nhe h

Infinite set k right coset describe
krny thy

Aik prove tha subset say related
pta nhe kahan say diya tha

Homomorphism ki example Deni
the aik

Aik group btana tha k ye abilian
h k nhe