Question 1
Correct
Mark 1.00 out of 1.00
Flag question

Every abelian group is:

a. Not cyclic
b. None ✔
c. Finite
d. cyclic

The correct answer is: None

Question 2
Correct
Mark 1.00 out of 1.00
Flag question

Number of elements of $(Z_{20}, +_{20}, \times_{20})$ of order 4 is:

a. 3
b. 4
c. 1
d. 2 ✔

The correct answer is: 2

Question 3
Incorrect
Mark 0.00 out of 1.00
Flag question

The order of 6 in $(Z_{20}, +_{20}, \times_{20})$ is:

a. 15
b. 10
c. 5 ✖
d. 1

The correct answer is: 10

Question 4
Incorrect
Mark 0.00 out of 1.00
Flag question

All generators of $(Z_{20}, +_{20})$ are:

a. Even ✖
b. None
c. Odd
d. Primes

The correct answer is: None

Question 5
Correct
Mark 1.00 out of 1.00
Flag question

Number of generators of $(Z_{10}, +_{10})$ is:

- a. Four ✔
- b. One
- c. Two
- d. Three

The correct answer is: Four

Question 6
Incorrect
Mark 0.00 out of 1.00
Flag question

Every cyclic group of finite order has :

- a. Odd number of generators
- b. Even number of generators
- c. At least two generators ✖
- d. None

The correct answer is: None

Question 7
Incorrect
Mark 0.00 out of 1.00
Flag question

Every element of any cyclic group is :

- a. None
- b. Has infinite order
- c. Has finite order ✖
- d. A generator

The correct answer is: None

Question 8
Correct
Mark 1.00 out of 1.00
Flag question

Every infinite cyclic group has :

- a. None
- b. Exactly two generators ✔
- c. One generator
- d. More than two generators

The correct answer is: Exactly two generators

Question 9
Correct
Mark 1.00 out of 1.00
Flag question

The number of generators of the subgroups of $(Z_{20}, +_{20}, \times_{20})$ of order 10 is :

- a. 1
- b. 10
- c. 4 ✔
- d. 3

The correct answer is: 4

Question 10
Correct
Mark 1.00 out of 1.00
Flag question

Number of subgroups of $(Z_{30}, +, \times)$ is:

- a. 6
- b. 8 ✔
- c. 2
- d. 4

The correct answer is: 8

Finish review

Let G=<a> be cyclic of order 24:

A) Find all subgroups of G.

B) Find order of a^4, a^7, a^{15}.

C) Find all generators of G.

D) Find all elements of order 8.

E) Find all subgroups of order 8.

F) If $H \leq G$ of order 8, find all generators of H.

Let G=<a> be cyclic of order 30:

A) Find all subgroups of G.

B) Find order of a^4, a^7, a^{15}.

C) Find all generators of G.

D) Find all elements of order 10.

E) Find all subgroups of order 10.

F) If $H \leq G$ of order 10, find all generators of H.

Let $G = \langle a \rangle$ be cyclic of order 30.

A) All subgroups of G

$H_1 = \{e\}$ is a subgroup of order 1

$H_2 = \{e, a^{15}\}$ " " " " 2

$H_3 = \{e, a^{10}, a^{20}\}$ " " " " 3

$H_5 = \{e, a^6, a^{12}, a^{18}, a^{24}\}$ " " 5

$H_6 = \{e, a^5, a^{10}, a^{15}, a^{20}, a^{25}\}$ " " 6

$H_{10} = \{e, a^3, a^6, a^9, \cdots, a^{27}\}$ " " 10

$H_{15} = \{e, a^2, a^4, a^6, a^8, \cdots, a^{28}\}$ " " 15

$H = G = \langle a \rangle$ is a subgroup of order 30.

B) $|a^4| = \frac{30}{\gcd(4,30)} = 15$

$|a^7| = \frac{30}{\gcd(7,30)} = 30$

$|a^{15}| = \frac{30}{(15,30)} = 2.$

c) $a, a^7, a^{11}, a^{13}, a^{17}, a^{19}, a^{23}, a^{29}$.

d) a^3, a^9, a^{21}, a^{27}

e) $H = \{e, a^3, a^6, a^9, a^{12}, \cdots, a^{27}\}$ only one

f) $H \leq G$ of order 10

All generators a^3, a^9, a^{21}, a^{27}.

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Let G be cyclic of order 24. say $G = \langle a \rangle$

A) Find all subgroups of G.

$H_1 = \{e\}$ is a subgroup of order 1

$H_2 = \{e, a^{12}\}$ " " of order 2

$H_3 = \{e, a^8, a^{16}\}$ " " " 3

$H_4 = \{e, a^6, a^{12}, a^{18}\}$ " " " 4.

$H_8 = \{e, a^3, a^6, a^9, a^{12}, a^{15}, a^{18}, a^{21}\}$ is of order 8

$H_6 = \{e, a^4, a^8, a^{12}, a^{16}, a^{20}\}$ is a subgroup of order

$H_{12} = \{e, a^2, a^4, a^6, \ldots, a^{22}\}$ " " " " 12

$H_{24} = G$ is a subgroup of order 24.

B) $|a^4| = \frac{24}{g.c.d(4,24)} = \frac{24}{4} = 6.$

$|a^7| = \frac{24}{g.c.d(7,24)} = 24.$

$|a^{15}| = \frac{24}{g.c.d(24,15)} = 8.$

C) All generators $= \{a, a^5, a^7, a^{11}, a^{13}, a^{17}, a^{19}, a^{23}\}$

D) a^3, a^9, a^{15}, a^{21}

E) only one $\{e, a^3, a^6, a^9, a^{12}, a^{15}, a^{18}, a^{21}\}$

F) a^{15}, a^{21}.