

## MASC 1024 Test 3, Practice Test

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1. Classify as an example of the commutative property, the associative property, or both.

$$2 + (3 + 5) = (2 + 3) + 5$$

Select the correct answer.

- commutative  
 both  
 associative

2. Consider the set  $A = \{1, 4, 7, 9\}$  with an operation  $*$  defined by the table.

$a * b$  means find the entry in row  $a$  and column  $b$ ; for example,  $7 * 9 = 9$  (the entry in row 7 and column 9). Find  $9 * 9$ .

$*$	1	4	7	9
1	9	7	1	4
4	7	9	4	1
7	1	4	7	9
9	4	1	9	7

Select the correct answer.

- 1  
 4  
 7  
 9

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3. Consider the set  $A = \{1, 4, 7, 9\}$  with an operation  $*$  defined by the table.

$a * b$  means find the entry in row  $a$  and column  $b$ ; for example,  $7 * 9 = 9$  (the entry in row 7 and column 9). Find  $1 * 7$ .

$*$	1	4	7	9
1	9	7	1	4
4	7	9	4	1
7	1	4	7	9
9	4	1	9	7

Select the correct answer.

- 7
- 1
- 9
- 4

4. Consider the set  $\mathbb{N}$  of natural numbers and an operation  $\leftarrow$  which means select the first of the two. That is,  
 $4 \leftarrow 3 = 4$  ;  $3 \leftarrow 4 = 3$  ;  $5 \leftarrow 7 = 5$  ;  $6 \leftarrow 6 = 6$   
Is the set  $\mathbb{N}$  closed for the operation of  $\leftarrow$  ?

Select the correct answer.

- no
- yes

5. Consider the operation  $\bullet$  defined by the table.

Find  $\square \bullet \circ$

$\bullet$	$\square$	$\triangle$	$\circ$
$\square$	$\circ$	$\square$	$\triangle$
$\triangle$	$\square$	$\triangle$	$\circ$
$\circ$	$\triangle$	$\square$	$\circ$

Select the correct answer.

- $\square$
- $\triangle$
- $\circ$

6. Consider the operation  $\bullet$  defined by the table.

Find  $\square \bullet \circ$

$\bullet$	$\square$	$\triangle$	$\circ$
$\square$	$\circ$	$\square$	$\triangle$
$\triangle$	$\square$	$\triangle$	$\circ$
$\circ$	$\triangle$	$\square$	$\circ$

Select the correct answer.

- $\triangle$
- $\circ$
- $\square$

7. Let  $S = \{1, 2, 3, \dots, 99, 100\}$ . Define an operation  $\otimes$  as  $a \otimes b = 2a + b$ . Check the commutative and associative properties.

Select the correct answer.

- neither
- associative but not commutative
- commutative but not associative
- associative and commutative

8. What is a prime number?

Select the correct answer.

- The natural number that has exactly two divisors.
- The natural number that has more than two divisors.

9. Is the number 1,997 prime?

Select the correct answer.

- Prime
- Not prime

10. Is the statement  $9|47$  true or false?

Select the correct answer.

- False
- True

11. Is the statement  $5|47$  true or false?

Select the correct answer.

- False
- True

12. Write the prime factorization for the number 144.

Select the correct answer.

- $2^2 \cdot 3 \cdot 5^2$
- $2^4 \cdot 3^2$
- $2^3 \cdot 3$

13. Find the g.c.f. and l.c.m. of the sets of numbers  $\{12, 54, 171\}$ .

Select the correct answer.

- 3; 2,052
- 1; 252
- 12; 360

14. Two movie theaters, UAI and UAII, start their movies at 7:00 P.M. The movie at UAI takes 60 minutes and the movie at UAII takes 90 minutes. If the shows run continuously, when will they again start at the same time?

Select the correct answer.

- 12:00 P.M.  
 10:00 P.M.  
 2:30 P.M.

15. Find a rational number and an irrational number between the given pair of numbers.

2 and 3

Select the correct answer.

- 2.5 and  $\frac{2}{3}$   
 2.5 and  $\frac{2\pi}{3}$   
  $2 + i$  and  $\frac{2\pi}{3}$   
  $2 + i$  and  $\frac{2}{3}$

## ANSWER KEY

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1. associative
2. 7
3. 1
4. yes
5.  $\Delta$
6.  $\Delta$
7. neither
8. The natural number that has exactly two divisors.
9. Prime
10. False
11. False
12.  $2^4 \cdot 3^2$
13. 3; 2,052
14. 10:00 P.M.
15. 2.5 and  $\frac{2\pi}{3}$