# Hour:

# **MATH 7: CHAPTER 3 STUDY GUIDE (NUMBER THEORY)**

#### 3.1 Factors and Multiples: examples on pages 104-106

- > Tips: Factor = is any integer that divides the given integer with no remainder. For example, 3 and 7 are factors of 21
- > Tips: Multiple = is the product of itself and any natural number. For example, the multiples of 9 are 9, 18, 27, 36, 45, etc.

List the first five multiples of each given number.

1. 7: 7,14,21,28,35

8,16,24,32,40

List all of the factors of each number in numerical order.

5. 16 = 1, 2, 4, 8, 16

6. 24= (1, 2, 3, 4, 6, 8, 12, 24)

3. 16: (16, 32, 48, 64, 80)

4. 23: 23, 46, 69, 92, 115

7. 36 = 1,2,3,4,6,9,12,18,36

8. 45 = 1, 3, 5, 9, 15, 45

### 3.2 Divisibility: examples on pages 108-110

> Tips: Divisibility Table

2. 8:

- 2 = the integer ends in an even digit 0, 2, 4, 6, or 8
- 3 = the sum of the integer's digits is divisible by 3
- 4 = the number formed by the last 2 digits is divisible by 4
- 5 = the integer ends in 0 or 5
- 6 = the integer is divisible by both 2 and 3
- 8 = the number formed by the last 3 digits is divisible by 8
- 9 = the sum of the integer's digits is divisible by 9
- 10 = the integer ends in 0

For each number, decide if it is divisible by 2, 3, 4, 5, 6, 8, 9, 10.

9. 45 3,5

10. 160

2 11 5 12 13

11. 312

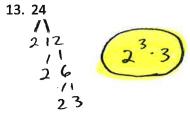
51 120

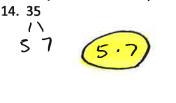
12. 51,120

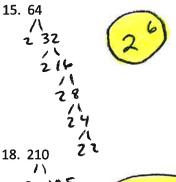
### 3.3 Prime Numbers: examples on pages 111-113

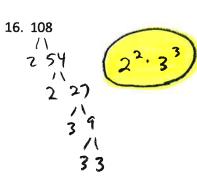
- > Tips: Prime Number = is a natural number greater than 1 that has no positive divisors other than 1 and itself (examples: 2, 3, 5, 7)
- > Tips: Composite Number = is any natural number greater than 1 that has positive factors other than 1 and itself (examples: 4, 6, 8, 9, 10)
- Tips: Factor Tree Rules
  - 1) always start with the smallest prime factors
  - 2) only circle prime numbers
  - 3) keep factoring numbers until all remaining numbers are prime numbers

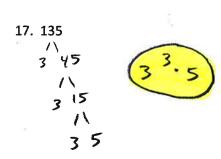
Complete each factor tree or factor ladder; then write the prime factorization (example  $36 = 2^2 \times 3^2$ ).

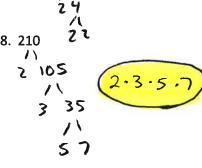








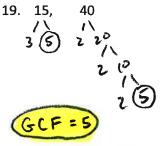


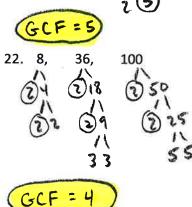


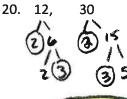
#### 3.4 Greatest Common Factor (GCF): examples on pages 117-119

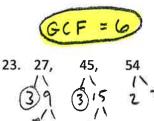
- > Tips: Greatest Common Factor (GCF) = is the greatest common number between 2 or more numbers (matching)
- > Tips: Relatively Prime = is when the only positive integer that evenly divides both numbers is 1 (one is not a prime number)

Use prime factorization to find the GCF of each set of numbers.





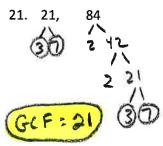


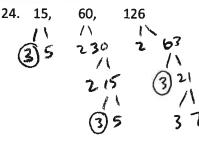


3)5

(3)3





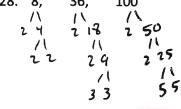




#### 3.5 <u>Least Common Multiple (LCM)</u>: examples on pages 120-122

> Tips: To find the LCM use the <u>highest power</u> of each prime factor & variable Use prime factorization to find the LCM of each set of numbers.

$$2^{3} \cdot 3 \cdot 5 = 126$$
28. 8, 36, 100



## 3.9 Number Patterns: examples on pages 136-137

> Tips: To find a number pattern, calculate the difference between each number

Find the last two numbers in each sequence.