

## LESSON ONE P.6 MATHEMATICS CLASS WORK WEEK 3

### TOPIC: PATTERNS AND SEQUECE

### SUB TOPIC: USING FACTORISATION TO FIND MISSING INFORMATIONS

#### Examples

a) The prime factors of 30 are  $2 \times y \times 5$ , find  $y$

$$\begin{array}{rcl} \text{If } 2 \times 3 \times y = 30 & \text{find } y & \\ 2 \times 3 \times y & = & 30 \\ \underline{6y} & = & \underline{30}^5 \\ 6 & & 6 \\ Y & = & 5 \end{array}$$

b) If  $144 = a^4 \times b^2$  find 'a' and 'b'

$$\begin{array}{r|l} 2 & 144 \\ \hline 2 & 72 \\ \hline 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \quad \begin{array}{l} 2 \times 2 \times 2 \times 2 \times 3 \times 3 \\ \\ = 2^4 \times 3^2 \\ \\ \text{so } 2^4 \times 3^2 = a^4 \times b^2 \\ \\ \therefore a = 2 \quad \text{and} \quad b = 3 \end{array}$$

#### Activity

1. Find the value of the unknown if the factors of;

- 12 are  $\{2_1, 2_2, k\}$
- 20 are  $\{y, 2_2, 5_1\}$
- 36 are  $\{2_1, 2_2, 3_1, p\}$

2. Find the value of the unknown if;

- $48 = b^4 \times m^1$
- $40 = a^3 \times b^1$
- $75 = m^1 \times n^2$

## LESSON TWO

### TOPIC: PATTERNS AND SEQUECE

### SUB TOPIC: MULTIPLES OF NUMBERS

**Content:**

- Listing multiples.
- The common multiples
- The LCM

**Examples:** (i) List the multiples of 4 between ten and 30.

$$M_4 = \{4, 8, 12, 16, 20, 24, 28, \dots\}$$

$M_4$  between 10 and 30 are

$$\{12, 16, 20, 24, 28\}$$

- (ii) Work out the LCM of 24 and 36  
 (a) Using multiples  
 (b) By prime factorization method.

i.e.

2	24	36
2	12	18
2	6	9
3	3	9
3	1	3
	1	1

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3$$

$$= 72$$

### Activity

1. List down all multiples of 3 less than 15
2. How many multiples of 6 are between 0 and 30
3. Find the LCM of the following
  - a) 18 and 24
  - b) 12 and 20
  - c) 16 and 36
  - d) 9 and 15

## LESSON THREE

### TOPIC: PATTERNS AND SEQUECE

**SUB TOPIC:** Finding LCM and GCF by prime factorization using a venn diagram

**Content:**

- Representing prime factors on the venn diagrams.
- Find the GCF/HCF and LCM from the venn diagram

**Examples:** (i) Work out the prime factors of 30 and 36

2	30
3	15
5	5
	1

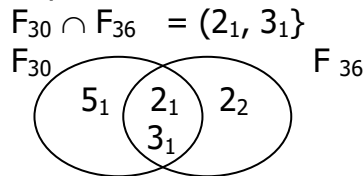
and

2	36
2	18
3	9
3	3
	1

$$F_{30} = \{2_1, 3_1, 5_1\}$$

$$F_{36} = \{2_1, 2_2, 3_1, 3_2\}$$

(ii) Represent the factors above on a well-drawn Venn diagram



(iii) Use the venn diagram to find the:

(a) GCF of 30 and 36

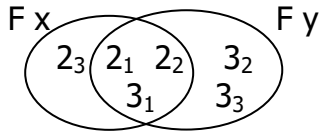
$$\begin{aligned} \text{GCF} &= F_{30} \cap F_{36} \\ &= \{2_1, 3_1\} \\ &= \underline{2 \times 3} \\ &= \underline{\underline{6}} \end{aligned}$$

(b) LCM of 30 and 36

$$\begin{aligned} \text{LCM} &= F_{30} \cup F_{36} \\ &= \{2_1, 2_2, 3_1, 3_2, 5_1\} \\ &= \underline{2 \times 2 \times 3 \times 3 \times 5} \\ &= \underline{\underline{180}} \end{aligned}$$

**Activity**

- Using prime factorisation, find the LCM and GCF of the following
  - 24 and 36
  - 12 and 18
  - 30 and 40
  - 15 and 18
- Use the venn diagram below to find the LCM and GCF



**LESSON FOUR**

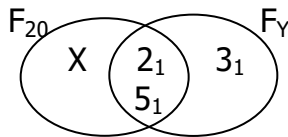
**TOPIC: PATTERNS AND SEQUECE**

**SUB TOPIC: FINDING UNKNOWN VALUES/ FACTORS.**

- Content:**
- Find the missing number
  - Find the unknown factors
  - Work out HCF and LCM

**Example:**

Find the unknowns



$$\begin{aligned}
 F_{20} &= \{x, 2_1, 5_1\} \\
 20 &= x + 2 \times 5 \\
 \underline{20} &= \underline{10} x \\
 10 &= 10 \\
 2 &= x \\
 \therefore x &= 2_2
 \end{aligned}$$

$$\begin{aligned}
 F_Y &= \{2_1, 3_1, 5_1\} \\
 &= 2 \times 3 \times 5 \\
 &= 6 \times 5 \\
 &= \mathbf{30}
 \end{aligned}$$

**GCF of 20 and 30**

$$\begin{aligned}
 \text{GCF} &= F_{20} \cap F_{30} \\
 \text{GCF} &= \{2_1, 5_1\} \\
 &= 2 \times 5
 \end{aligned}$$

**∴ GCF = 10**

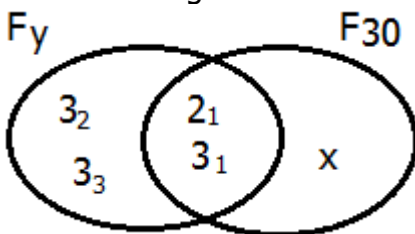
**LCM of 20 and 30**

$$\begin{aligned}
 \text{LCM} &= F_{20} \cup F_{30} \\
 &= \{2_1, 2_2, 3_1, 5_1\} \\
 &= 2 \times 2 \times 3 \times 5
 \end{aligned}$$

**∴ LCM = 60**

**Activity**

Study the Venn diagram below and use it to answer question that follow



- Find the value of y
- What is the value of x?
- Work out the GCF of Y and 30
- Find the LCM of the above numbers

## LESSON FIVE

### TOPIC: PATTERNS AND SEQUECE

#### SUB TOPIC: APPLICATION OF GCF / LCM

**Content:**

- Relationship between GCF and LCM
- Other problem related to HCF/GCF

#### Examples:

- The LCM of two numbers is 144 their GCF is 12 and one of these numbers is 48. Find the other number

Solution: Let 2<sup>nd</sup> No be y

$$1^{\text{st}} \text{ No} \times 2^{\text{nd}} \text{ No} = \text{LCM} \times \text{GCF}$$

$$\frac{48 \times y}{48_1} = \frac{144^{12} \times 12}{48_4} \text{ by 12}$$

$$y = \frac{12 \times 12^3}{4_1}$$

$$y = 36$$

- What is the largest possible divisor of 24 and 36.

#### NOTE:

- The largest possible divisor is GCF
- Therefore use only common factors to divide. ie factors which divide all both numbers.

② 24	36
② 12	18
③ 6	9
2	3

$$2 \times 2 \times 3 = 12$$

largest divisor = 12

#### Activity

- The LCM of two numbers is 60 while their GCF is 10 and one of these numbers is 20. Find the other number
- The LCM of two numbers is 270 while their GCF is 6 and one of these numbers is 54. Find the other number
- The LCM of two numbers is 216 while their GCF is 12 and one of these numbers is 24. Find the other number
- What is the largest possible divisor of 12 and 30
- Find the largest possible divisor of 14 and 16
- What is the largest possible divisor of 18 and 24