**P.5 MATHEMATICS LESSON NOTES TERM ONE, 2018**

**WEEK 1**

**LESSON 1**

**THEME: Sets**

**TOPIC: Set Concepts**

**SUBTOPIC: Equivalent and Non – Equivalents sets**

**COMPETENCE: LANGUAGE - Define sets**

**SUBJECT – Identifies equivalent sets and no – equivalent**

**-- Forms equivalent and non- equivalent sets**

**CONTENT**

-Equivalent sets are sets with the same number of elements/members. ( )

-Nonequivalent sets are sets with different number of elements or members. ( )

A = {1, 2, 3}

B = {4, 6, 7}

C = {6, 4, 7, 8}

A B **/** Set A is equivalent to set B

B C / Set B and C are non-equivalent

**ACTIVITY**

1. Which of the following pairs of sets are equivalent?
2. A = { Kato, Wasswa, Okello }

B = { Adikini, Amoti, Chandiru }

1. C = {the letters of the word Uganda.}

D = {The letters of the word, Africa)

1. E = { Odd numbers less than 10

F = {Fish, Meat, clouds}

1. J = {5, 10, 15, 20, 25}

K {2, 4, 6, 8, 10}

2. a). Write equivalent or non-equivalent

A = {car, kettle, dog}

B = Chair, Jerry can, bottle}

Set A has ----------- members and

Set B has ------------- members.

Set A and Set B are --------------.

1. L = {Pineapple, ball, orange, de=rum}

M = {cat, book, pail}

Set L has -------- members and

Set M has ------- members.

Set L and M are ----------------.

**REFERENCE:** A new MK p/sch. Mathematics 2000. Bk 4 pg 4 -7

Functional p/Mathematics BK 5 pg 3

**LESSON 2**

**THEME: Sets**

**TOPIC: Set Concepts**

**SUBTOPIC: Equal and non-equal sets**

**COMPETENCE: LANGUAGE - Define sets**

**SUBJECT – Describes equal and non-equal sets**

**-- Forms sets**

**-- names sets**

**-- Distinguishes between equal; and non-equal sets.**

**CONTENT**

-Equal sets are sets with same number of elements which are exactly alike (=)

-Non-equal sets re sets with the same number of different number of elements not exactly alike (=)

**EXAMPLE**

A = {1, 2, 3} Set A = Set C

B = {2, 3, 4} Set B = Set C

C = {3, 2, 1}

**ACTIVITY**

1. **K L**

Set K and Set L are -----------------------

1. P = { 2, 6, 7 } Q = { 1, 5, 3 }

Set P and Q are ----------------------

1. **S T**

Set S and Set T are ----------------------------

1. **M N**

Set M and N are ­­­­­­­­­­­­­­­­­­­--------------------------

2. Which of the following pairs are equal?

1. A = { a, b, c, d } b) C = { cat, dog, rat }

B = {b, c, a, d} D = {rat, dog, cat}

1. E = { fish, banana, meat } d) K = { 0, 2, 4, 6 }

F = {fish, potatoes, meat} L = {6, 0, 4, 2}

1. P = { S, U, N, A }

F = {E, V, I, L}

**REFERENCES –** A new MK pupils book 4 page 8

**LESSON 3**

**THEME: Sets**

**TOPIC: Set Concepts**

**SUBTOPIC: The empty set**

**COMPETENCE: LANGUAGE - Defines describes an empty set**

**SUBJECT – Identifies empty sets**

**-- forms sets**

**-- names sets**

**-- Distinguishes between equal; and non-equal sets.**

**CONTENT**

An empty set is the one without any element in it.

It is also known as a null set.

The symbol is used to mean an empty set.

**EXAMPLE**

A = {men with 10 heads

B = {goats as big as an elephant}

The sets given above are empty.

**ACTIVITY**

1. State whether the sets below are empty or not.
2. B = {girls who are as old as their mothers.}
3. F = {A cow which can fly like an airplane}
4. K = { A bull which lays eggs }
5. P = { An animal which lays eggs }
6. C = { Birds which produce milk }
7. D = { Boys in the class who are as old as their brothers}

Give any five examples of empty sets

**REFERENCES**

* Functional math’s Bk 5 pg 3 and 4
* A new MK pupils Bks Pg 3

**LESSON 4**

**THEME: Sets**

**TOPIC: Set Concepts**

**SUBTOPIC: Intersection of sets**

**COMPETENCE: LANGUAGE – Describes intersection of sets**

**SUBJECT – Identifies the intersection region**

**-- Identifies the elements in the intersection region**

**CONTENT**

**INTERSECTION OF SETS**

**A B**

The symbol” is used to mean intersection.

It is the region / set of common elements

Intersection set

**EXAMPLE**

1. Q = {a, b, c, d, e, f} 2. K = {e, q, a, t }

P = {a, e, I, o, u} L = {e, q, u, a, l}

Find P Q Find K L

= {a, e} = {e, q, a}

**ACTIVITY**

Find the intersection of the following pair of sets.

1. A = { book, pen, table, chair } b) C = { hat, shorts, shirts }

B = {house, bed, table, mat, chair} D = {jacket, shirt, coat}

1. E = { 1, 3. 5, 7, 9, 11 } d) G = { a, e, I, o, u }

F = {1, 2, 5, 8, 9, 10} H = { a, r, c, h, e }

1. I = { a, b, c, d, e }

J = { 1, 2, 3, 4, 5 }

K = , ,

L = , ,

**REFERENCE:**

-Functional p/math book 5 pages 5 and 6

- A new MK pupils Bk 5 page 5

- Bk 4 pg 9, 10, 11

**LESSON 5**

**THEME: Sets**

**TOPIC: Set Concepts**

**SUBTOPIC: Intersection, union of sets and Venn diagram.**

**COMPETENCE: - Identifies and represents members. On the Venn diagram.**

**- Identifies members of intersection from the Venn diagram.**

**EXAMPLE**

1. Study the Venn diagram given and find
2. P Q
3. P Q

A B = {1, 3}

A B = {1, 2, 3, 4, 5, 6,}

P Q = {b, e, d}

P Q = {a, b, c, d, e, f, g, h}

**P Q**

f

g

h

2

a

c

1. Represent the following sets on a Venn diagram and find;
2. A B
3. B A

A = {1, 2, 3} B = {9, 3, 4, 5, 1, 6}

**A B**

4 5

6 9

**ACTIVITY**

1. Represent the following sets on a Venn diagram and find:
2. C D
3. C D
4. C = { Monday, Tuesday, Wednesday, Thursday } D = {Monday, Thursday, Friday, Saturday}
5. C = {Z, K,L, M } D= { I, k, l }
6. C = { 10, 11, 12, 13, 15 } D = { 8, 10, 12, 14, 16 }
7. C = { c, r, a, w, l } D = { j, a, c, k, w, a, l }

**WEEK 2**

**LESSON 1**

**DIFFERENCE OF SETS**

**K L**

**(K – L) (L – K)**

**EXAMPLE**

List members in;

1. R – S = { 2, 6, 8 }
2. S – R = { 3, 5, 7 }

List members of;

1. T – V = { a, e}
2. V – T = { U }

**T N**

a

e u

**EXAMPLE**

Given that; R = {9, 2, 4, 6, 8}

S = {4, 3, 5, 7, 9}

1. Represent the information on a Venn diagram

R S

2 3

6 5

8 7

**ACTIVITY**

1. Given that P = { 2, 4, 5, 6, 7 }

Q = {5, 7, 8, 9}

1. Represent the information on the Venn diagram.
2. Find i) P – Q

ii) Q – R

1. M = { 2, 4, 5, 6 }

N = {5, 6, 7, 8}

1. Represent the information on a Venn diagram
2. Find i) M – N

ii) N – M

1. W = { box, girl, pin, boy }

X = {man, coin, pin, store, box}

Find I) W – X

ii) X – W

**LESSON 2**

**NUMBER OF ELEMENTS**

**EXAMPLE 1**

Given that Q = {a, b, c, d, e, f}

Find n (Q)

= 6

**EXAMPLE 2**

Given that K = {2, 4, 6, 8}

L = {1, 2, 3, 4, 5, 6}

Find:

1. n (L ) b) n (L K )

L = {1, 2, 3, 4, 5, 6} L K = {2, 4, 6}

N (L) = 6 n (L K) = 3

1. N (K – L )

K – L = {8}

N (K – L) = 1

**ACTIVITY**

1. Study the Venn diagram below and answer questions that follow.

Find;

1. n (P Q)
2. n (P Q)
3. n ( Q )
4. n ( P )
5. n( Q – P )

**P Q**

f b

g d

h

1. Given that M = { 1, 2, 3, 4, 5, 6, 7 }

N = { 1, 3, 5, 7, 9, 11 }

1. Represents the information on a Venn diagram
2. Find;
3. n (M)
4. n (N – M)
5. n (N M )
6. n ( N M )
7. n ( M – N )

**LESSON 3**

**DESCRIBING REGIONS ON THE VENN DIAGRAM**

**EXAMPLE**

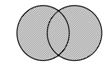
1. **P Q ii) A B**

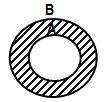
Set Q Set B only or B- A

**ACTIVITY**

**Describe the shaded parts**

1. **X Y iv) C D**



1.   **G v)**

**F**

1. **S T vi)**

**M N**

**LESSON 4**

**LISTING AND FINDING SUBSETS**

* A subset is any set which is a member of a bigger set called a universal set.
* The symbol is used to mean subset.
* Any set is a subset of its own.
* The empty set is also a subset of any given set

**EXAMPLE 1**

Y = {1, 2, 3} Find the number of subsets in Y.

= { } , { 1 } , { 2 } , { 3 } , { 1, 2 } , { 1, 2 } , { 1, 3 } , { 2, 3 } , { 1, 2, 3 }

= 8 Subsets

**OR**

No. of subsets = 2n

Where n = number of elements.

= 23

= 2 x 2 x 2

= 8 elements

**EXAMPLE 2**

1. List down all the subsets in

P = {a, b, c, d}

{ } , { a } , { b } , { c } , { d } , { a, b } , { a, c } , { a, d } , { b , c } , { b, d } , { c , d } , { a, b, c } , { a, b, d } , { b, c, d } , { a, b, c, d } , { a, c, d }

1. How many subsets had P?

No. of subsets = 2n

= 24

` = 2 x 2 x 2 x 2

**= 16 Subsets**

**EXERCISE**

1. List down number of subsets in the following sets.
2. A = { 1, 2 }
3. B = {x, y, z }
4. C = { I, o , u }
5. Find the number of subsets in the following sets
6. K = { }
7. M = { 1 }
8. Q = { a, b }
9. P = { daddy, mummy, uncle }

**LESSON 5**

**PROPER SUBSETS**

These are subsets of a given set excluding the universal set. They are got using (2n) – 1

**EXAMPLE**

1. Find the number of proper subsets in

K = {a, b, c, d, e, f}

= 2n – 1

= 26 – 1

= (2 x 2 x 2 x 2 x 2 x 2)

=({4 x 4) – 1

= 64 –1

= 63 proper subsets.

1. Set X has 6 members. How many proper subsets does X has?

= 2n – 1

= 28 – 1

= 2 x 2 x 2 x 2 x 2 x 2) – 1

= 64 – 1

= 63 subsets

**ACTIVITY**

Find the number of proper subsets in the following.

1. N = { a, e, i, o, u }
2. Set Q has 3 elements.
3. Set K has 4 members.
4. Set P has 7 elements.
5. If a set has 1 member, hoe many proper subsets does it has?

**WEEK 3**

**LESSON 1**

Representing subsets on Venn diagrams.

**EXAMPLE**

Draw a Venn diagram to show that all goats are animals

Animals A

Goats or G

**ACTIVITY**

1. Draw a Venn diagram to show that W is a subset of Y.
2. Draw a Venn diagram to show that x Z.
3. Draw a venn diagram to show that PnQ =P
4. K = {Musa, Tom, John, David} L = {Tom John, Musa} Represent it on a Venn diagram.
5. If M = {a, e, I, o, u} N = {e, o} Represent this information on a Venn diagram.
6. Draw a Venn diagram to show that all boys are males.

**LESSON 2**

**PROBABILITY**

This is the measure of chance.

It ranges from 0 – 1

**PROBABILITY OF TOSSING A COIN.**

A coin has two faces i.e. tail (T) and Head (H).

The sample space (Total chances) on tossing a coin is 2.

**EXAMPLE**

What is the probability that a coat of arms will show up when a coin is tossed?

n (Dc) Coat of arms is 1

n (T.C) Sample space is 2

Prob. =

Prob. =

**ROLLING A DICE**

A dice has 6 faces numbered 1, 2, 3, 4, 5, 6

Therefore, the total chances (sample space) = 6

**EXAMPLE**

A dice is rolled once. What is the probability that;

1. Odd numbers show up

(s,s)1, 2, 3, 4, 5, 6

Odd numbers are { 1, 3, 5 }

**Prob.**

1. Prime numbers show up?

1, 2, 3, 4, 5, 6

Prime numbers are 2, 3, and 5?

**Prob. =**

**ACTIVITY**

1. Simon tossed a coin once. What is the probability of getting;
2. A head on top?
3. A tail on top?
4. The dice is rolled once. What is the probability that;
5. An even number shows up?
6. A multiple of 2 shows up?
7. A multiple of 3 shows up?
8. A composite number shows?
9. A triangular number shows up?
10. A number less than 5 shows up?
11. A product of 2 and 2 shows up?

**LESSON 3**

**DAYS OF THE WEEK**

Number of days in the week =7

**EXAMPLE**

1. The DEO will visit us next week. What is the probability that he will visit us on a day that starts with letter “T”?

Prob. =

Sample space = S, M, T, W, T, F, S

Prob. =

1. What is the probability that Ann’s wedding will take place on a day which begins with letter “S”?

Sample space = S, M, T, W, T, F, S

Number of days which begin with T are 2

Prob. =

Prob. =

**ACTIVITY**

1. What is the probability that Allen goes to school on Tuesday?
2. James celebrated his birth day last week. What is the probability that it was a Wednesday?
3. What is the probability that Katya will finish his work on a day that begins with letter “s”?
4. What is the probability that it will rain on a day which begins with letter F?
5. The probability of Musa passing . What is the probability that he will fail.
6. The probability that the Cranes will win is . What is the probability that it will loose?

**THEME: NUMERACY**

**TOPIC: WHOLE NUMBERS**

**LESSON 4**

**EXAMPLE**

1. What is the place value of each digit in the number 9 7 3 4 2 1 8

9 7 3 4 2 1 8

Ones

Tens

Hundreds

Thousands

Ten thousands

Hundred thousands

Millions

1. What is the palace value of 2 in the number? 4 2 1 3 3 6?

4 2 1 , 3 3 6 ?

Ten thousands

**ACTIVITY**

1. What is the place value of each digit in the numbers below?
2. 4 3 1 2 26
3. 7 5 6 0 8 2
4. 2 5 6 0 7 0
5. 1 6 8 4 7 9
6. 1 4 6 8 5 0 3
7. Write the place value of the underlined digit in each of the following?
8. 9 7 3 4 2
9. 3 9 0 7 00
10. 2 6 3 1 4 7
11. 1 6 1 1 1 2 1
12. 2 3 4 5 6 7

**LESSON 5**

**FINDING THE VALUE OF EACH DIGITS**

**EXAMPLES**

1. What is the value of each digit in 9, 7, 3, 4, 2, 6, 8

Note: Value = digit x place value

9 7 3 4 2 6 8

8 x 1 = 10

6 x 10 = 60

2 x 100 = 200

4 x 1000 = 4,000

3 x 10000 = 30,000

7 x 100,000 = 700,000

9 x 10000000 = 9,000,000

1. What is the value of 6 in the number 2 6 1 2 7?

2 6 1 2 7

6 x 1000 = 6000

**ACTIVITY**

1. Write down the value of each digit in the following numbers?
2. 2 3 7 2
3. 1 4 9 3
4. 4 2 6 3 8
5. 1 0 2 3 4 2 6
6. 9 2 6 1 1 1

**WEEK 4**

**LESSON 1**

**OPERATIONS ON VALUES OF WHOLE NUMBERS**

**EXAMPLE**

1. Find the sum of the value of 4 and 6 in 672411

6 7 2 4 1 1

4 x 100 = 400

6 x 1000000 = + 600000

600,400

1. What is the difference between the value of 3 and 6 in 983647?

9 8 3 6 4 7

6 x 100 = 600

3 x 1000 = 3000

Difference

3 0 0 0

- 6 0 0

2400

1. What is the product of the value of 8 and 4 in 98364?

9 8 3 6 4

4 x 1 = 4

8 x 1000 = 800

Product = 8000 x 4 = 32000

**ACTIVITY**

1. Find the sum of the value of 1 and 7 in 127
2. Find the difference between the value of 2 and 6 in 92678.
3. Find the sum of the value of the underlined digits in the numbers below.
4. 3 4 5 0
5. 8 5 3 2 1
6. Find the product of the value of the underlined digit in;
7. 8 9 3 b) 8 5 3 2 1
8. Work out the quotient of the value of 6 and 1 in 6 3 2 1 0
9. What is the quotient of the value of 7 and the place value of 5 in 7 5 3?

**LESSON 2**

Writing words in figures

**Note**

-A number is an idea of how many, how much and how far.

A numerical is a symbol used to represent a number.

**EXAMPLES**

1. Write thirty two thousand, six hundred thirteen in figures

H T O

6

1

3

2

3

Thousand

= 3 2, 6 1 3

1. Write one hundred nine thousand, thirty four in figures

H T O

0

3

4

9

1

0

Thousand

= 1 0, 9 0 3 4

**ACTIVITY**

Write the following in words.

1. Four thousand sixty five.
2. Four hundred thousand eighty three.
3. One hundred thousand one.
4. Ten thousand one.
5. Eighty seven thousand ninety nine.
6. Nine thousand ninety nine.
7. Eighty hundred, eighty hundred fourteen.

**LESSON 3**

**WRITING FIGURES IN WORDS.**

**EXAMPLE**

1. Write 2 3 7, 2 0 6 in words

2

0

6

7

2

3

Thousand

= Two hundred thirty seven thousand, two hundred six.

1. 9 9, 1 1 4

1

1

4

9

9

Thousand

= Ninety nine thousand, one hundred fourteen.

**ACTIVITY**

1. Write each of the following in figures;
2. 4021
3. 2,018

**NOTE**

1. Identify major place values.
2. Write the numerical quantities left.
3. Draw a box for major place values
4. 13,419
5. 14,999
6. 49,114
7. 111,111
8. 70,707
9. 800,800
10. 9,999,114
11. 6,100,100

**LESSON 4**

**EXPANDING WHOLE NUMBERS USING PLACE VALUES**

**EXAMPLE**

1. Write 4 5 3 2 in expanded form using place values

4 5 3 2 = (4 x 1000) + (4 x 100) + (3 x 10) + (2 x 1)

1. Expand 78023 using place values;

7 8 0 2 3 = (7 x 10000) + (8 x 1000) + (2 x 10) + (3 x 1)

**ACTIVITY**

1. Write the following in expanded form using place values.
2. 89
3. 872
4. 15,301
5. 2873
6. 19972
7. 8261
8. 992,789
9. 120,203
10. 600,742
11. 178,109

**LESSON 5**

**EXPANDING NUMBERS USING VALUES**

**EXAMPLES**

1. Expand 4532 using values;

4532 = (4 x 1000) + (5 x 100) + (3 x 10) + (2 x 1)

= 4000 + 500 + 30 + 2

1. Write 78023 in expanded form using values.

48023 = (4 x 10000) + (8 x 1000 + (2 x 10) + (3 x 1)

= 40000 + 8000 + 20 + 3

**ACTIVITY**

Expand the following using values

1. 74
2. 673
3. 19,194
4. 26,478
5. 207, 468
6. 442,002
7. 301,020
8. 449,999

**WEEK FIVE**

**LESSON 1**

**EXPANDING USING EXPONENTS / POWERS OF 10 /MULTIPLES OF 10**

1. Expand 789 using exponents

72 81 90 = (7 x 102) + (8 x 102) + (8 x 101) + (9 x 100)

1. Write 9381 in expanded form using powers of 10

(9 x 103) + (3 x 102) + (8 x 101) + (1 x 100)

**ACTIVITY**

Write each of the following in expanded form using exponents.

1. 493
2. 6785
3. 938102
4. 723601
5. 12684
6. 100242
7. 13684
8. 3819420
9. 485001
10. 2436000

**LESSON 2**

Writing a single numeral from an expanded number.

**EXAMPLE**

1. What number was expanded to get: (4 x 100) + (5 x 10) + (8 x 1)?

= 4 x 100 + 5 x 10 + 8 x 1

= 400 + 50 + 8

= 458

1. Write 30000 + 600 + 4 as a single numeral

30000

600

+ 4

30604

1. Write (4 x 103) + (1 x 101) + (2 x 102) + (8/ x 100) as a single numeral.

4 x 103 = 4 x 1000 = 4 0 0 0

1 x 10 1 = 1 x 10 = 1 0

2 x 102 = 2 x 100 = 2 0 0

8 x 100 = 8 x 1 = + 8

= 4 2 1 8

**ACTIVITY**

Write the following as a single numeral.

1. (8 x 100 ) + ( 6 x 10 ) + ( 3 x 1 )
2. 500 + 90 + 0
3. 7000 + 300 + 7
4. (8 x104 ) + ( 7 x 103 ) + (4 x 102 ) + ( 3 x 101 ) + (4 x 100)
5. ( 2 x 100000 0 + ( 2 x 100 )+ ( 6 x 1) + (4 x 10 )
6. 9000 + 70
7. ( 2 x 105 ) + ( 6 x 100 )

**LESSON 3**

**ROUNDING OFF WHOLE NUMBERS**

0-4 are nearer to zero. Therefore, we round down to 0

5 – 9 are nearer to 10, we round up to 10

Rounding 4 -- -- 5 Rounding up

Down 3 -- --- 6 + 1

+0 2 -- -- 7

1 -- ---- 9

0 --

1. **ROUNDING OFF TO THE NEAREST TENS**

**EXAMPLE**

1. 74 7 4 2. 88. 8 8

+ 0 1

~ 7 0 ~ 9 0

74 ~ 70 Therefore 88 ~ 90

9 4 8

+ 1

9 5 0

948 ~ 950

**ACTIVITY**

**Round off the following to the nearest tens.**

1. 24
2. 42
3. 67
4. 156
5. 245
6. 134
7. 178
8. 9541
9. 4629
10. 69314

**LESSON 5**

**ROUNDING OFF TO THE NEAREST HUNDREDS**

**EXAMPLES**

1. Round off to the nearest hundreds.

5 3 0

+0 530 ~ 500

5 0 0Correct 3872 to the nearest hundreds.

3 8 7 2

1 3872 ~ 3900

3 9 0 0

**ACTIVITY**

Round off the following numbers to the nearest hundreds.

1. 136
2. 421
3. 363
4. 412
5. 1534
6. 1247
7. 2372
8. 3613
9. 9514

**LESSON 5**

**ROUNDING OFF TO THE NEAREST THOUSANDS**

**EXAMPLE**

1. 4 3 4 0 4 3 4 0 4340 ~ 4000

+0

4 0 0 0

1. 7 6 9 4 7 6 9 4 7694 ~ 8000

+ 1

8 0 0 0

**ACTIVITY**

Round off the following to the nearest thousands

1. 1240
2. 3408
3. 5631
4. 3941
5. 58244
6. 6815
7. 11242
8. 26041
9. 68514
10. 69314

**WEEK 6**

**LESSON 1**

**EXPRESSING HINDU – ARABIC NUMERALS AS ROMAN NUMERALS**

**NOTE:**

1. Basic Roman numeral are;

1 5 10 50 100 50 1000

I V X L C D M

1. Numbers which show repeated Roman numerals.

2 3 20 30 200 300

II III XX XXX CC M

1. Numbers got by subtraction: (4, 9)

4 = 5 – 1 = IV

9 = 10 – 1 = IX

40 = 50 – 10 = XL

90 = 100 – 10 = XC

400 = 500 – 100 = MC

1. Numbers got by addition

6 = 5 + 1 = VI

7 = 5 + 2 = VII

8 = 5 + 3 = VIII

60 = 50 + 10 = LX

70 = 50 + 20 = LXX

80 = 50 + 30 = LXXX

600 = 500 + 100 = DC

700 = 500 + 200 = DCC

800 = 500 + 300 = DCCC

All Roman numerals are written using capital letters only.

**EXAMPLE**

1. Express 25 in Roman numerals.
2. 2 5 = 20 + 5 b) 5 7 = 50 + 7

= XX + V = L + VII

**= XXV = LVII**

C) 4 9 = 40 + 9 d) 8 6 4 = 800 + 60 + 4

= XL + IX = DCCC + LX + IV

**= XLIX = DCCCLXIV**

**ACTIVITY**

**EXPRESS THE FOLLOWING AS ROMAN NUMERALS**

1. 29
2. 24
3. 14
4. 99
5. 31
6. 189
7. 242
8. 325
9. 483
10. 984

**LESSON 2**

**EXPRESSING ROMAN NUMERALS AS HINDU ARABIC NUMERALS**

**NOTE**

1. Some Roman numerals can’t be repeated i.e. VL.
2. The maximum number of times a Roman numeral can be repeated are three. ( I, X, C,-----)
3. When a smaller numeral appears before a bigger one, it means there is a subtraction.

IV = 5 – 1 = 4

XL = 50 – 10 = 40

IX = 10 – 1 = 90

**EXAMPLE**

Change to Hindu Arabic numerals.

1. X I X 2. X L I V

X I X = X + IX X L I V = XL + IV

= 10 + 9 = 40 + 4

**= 19 = 44**

1. L I V 4. C D I V

L I V = L + IV C D I V = CD + IV

= 50 + 4 = 400 + 4

**= 54 = 404**

1. D L X X I

D L X X I = D + LXX + 1

= 500 + 70 + 1

**= 571**

**ACTIVITY**

Express each of the following in Roman numerals.

1. VI
2. XXVI
3. LXXIX
4. XCVIII
5. CIV
6. CCIX
7. CDLXXXVIII
8. DCLV
9. CMXCIV
10. CMLXXVII
11. John was born on MCMLXII, express it in Hindu Arabic numerals.

**LESSON 3**

**WRITING ROMAN NUMERALS MORE THAN 3000**

These are written using a BAR on top to mean (x 1000)

**EXAMPLE**

1. Express 5000 as a Roman numeral

5000 = V

1. 30,000

30000 = XXX

**ACTIVITY**

Write the following as Roman numerals.

1. 4000
2. 6000
3. 7000
4. 8000
5. 94000
6. 24000
7. 55,263
8. 44,263

**LESSON 4**

**OPERATION ON ROMAN NUMERALS**

2. Joy was born in MCMLXXXIX. How old is she now? (In Roman numerals)

MCMLXXXIX = M + CM + LXXX + IX

= 1000 + 900 + 80 + 9

2015 – 1989 = 26 YEARS.

26 = 20 + 6

= XXVI

**EXAMPLE**

1. Add L X X + X I I

= L + XX + X + IX

= 50 + 20 + 10 + 9

= 70 + 19

= 89

**ACTIVITY**

1. Work out
2. L X X X I V
3. C C C L V – C X L V
4. X X X + X X V
5. L X X V I II
6. Amos was born in MCLXXII and married after XXV years. In which year did he get married?
7. Moses was born XXV, how old was he in X X X?
8. The time on the clock face is XI: XXX. What is it in words?

**LESSON 5**

**THEME: NUMERACY**

**TOPIC: OPERATIONS ON WHOLE NUMBERS.**

**ADDITION OF WHOLE NUMBERS**

**EXAMPLES**

1. Add: 473442 + 369298

3 6 9 2 9 8

4 7 3 4 4 2

**8 4 2, 7 4 0**

1. Kapere harvested some maize, his lorry carried 2865 kg on Monday and 2473 kg on Tuesday. How many kg of maize was carried in the two days?

Monday – 2 8 6 5 kg

Tuesday + 2 4 7 3 kg

5 3 3 8 kg

He carried 5338 kg

**ACTIVITY**

Work out the following?

1. 122,230 + 112,230
2. 12,674 + 146,793
3. 176,571 + 2,630
4. 345,164 + 132 + 245
5. 433,185 + 164,129
6. What is the sum of 368479 and 234567
7. There are 12643 men in the organization and 39613 women. How many people are in the organization altogether?
8. Ameba got 336001 votes in one constituency and 199,299 votes in the other constituency. How many votes did he bet altogether from the two constituencies?
9. In March, 236341 litres of milk were produced and in April 402969 litres were produced. How much milk was produced in the two months?

**WEEK 7**

**LESSON 1**

**SUBTRACTION OF WHOLE NUMBERS**

**EXAMPLE**

1. Work out 1 2 3 6 4 3

- 3 6 7 4 9

8 6 8 9 4

1. By how much is 367,015 greater, than 346,729?

3 6 7 0 1 5

- 3 4 6 7 2 9

0 2 0 2 8 6

**ACTIVITY**

3. 9 4 5 4 5 6

- 1 8 3 4 8

4. 1 3 4 5 6 7

- 4 5 3 2 5

1. 1 2 3 6 4 5

- 2 3 4 8

1. 2 7 4 8 6 3

- 5 2 6 8 4

1. A water tank holds 100,000 litres of water. If 36,190 litres are used, how much water is left in the tank?
2. Farmer planted 298,770 seedlings of coffee, 112,429 trees did not grow, and how many trees grew up?
3. A district had a population of 630,000 in the 1990 census. Of these, 350,231 were females. How many males were there in the district?
4. The distance between two airports is 123,908 km. If a plane had covered 99,045 km only. What distance was left?
5. A filling station sold 404,560 litres of petrol of the 987,403 litres in the tank. How much fuel was left?

**LESSON 2**

**MULTIPLICATION BY 2 DIGIT NUMBERS**

**EXAMPLES**

1. 3 5 2. 2 4 9

X 2 x 3 2

7 0 4 5 8

+3 5 + 7 4 7

4 2 0 7 9 2 8

**ACTIVITY**

**Work out the following**

1. 28 x 11
2. 34 x 12
3. 56 x 23
4. 77 x 12
5. 189 x 24
6. 397 x 22
7. 345 x 90
8. 409 73
9. 180 x 56
10. 455 x 60

**LESSON 3**

**WORD PROBLEMS INVOLVING MULTIPICATION**

**EXAMPLES**

1. A regular floor is covered by 26 tiles along its length and 15 along its width. How many tiles are there altogether?

2 6

X 1 5

1 3 0

+ 2 6 0

3 9 0 tiles

1. There are 146 rows of scouts and girls guides in each row there are 27 scouts and girl guides. How many scouts and girl guides are on the parade?

1 4 6 rows

X 2 7 (Scouts and girl guides)

1 0 2 2

+ 2 9 2 0

3 9 4 2

**ACTIVITY**

1. A rectangular playground measures 12 m by 48 m. What is the area of that play ground?
2. A parade of soldiers was made up to 233 rows. There are 50 soldiers in each roe. How many soldiers were there?
3. A printer produced 495 boxes of books. Each box had 24 books. How many books were there altogether?
4. Multiply 179 by 19.
5. What is the product of 432 and 63?
6. Find the product of 432 and 63.
7. There are 30 eggs on a tray. Find the number of eggs on 456+ trays?
8. A library has 16 shelves of books with 256 books on each shelf. How many books are in that library?

**LESSON 4**

**DIVISION BY 2 DIGIT NUMBERS**

**EXAMPLE**

1. Divide 5454 by 12.

0 4 5 2

12 5 4 2 4

4 8

6 2

6 0

2 4

- 2 4

0 0

= 4 5 2

1. Divide 3000 by 25

0 1 2 0

25 3 0 0 0

- 2 5

5 0

- 5 0

0 0

- 0 0

- -

= 120

**ACTIVITY**

1. 11 1 3 5 2 **2.** 14 3 3 0 5 4 **3.** 18 6 1 5 5 7
2. 14 2 9 8 6 2 **5**. 15 1 8 6 1 5 **6.** 18 1 8 6 4 8
3. 12 1 4 4 0 **8.** 17 1 4 2 8 **9**. 17 2 2 4 5 7
4. 23 1 4 2 8

**LESSON 5**

**WORD PROBLEMS INVOLVING DIVISION**

**EXAMPLE**

1. 1260 pupils sat for examination. If each class presented 60 pupils, how many classes were there?

0 0 2 1

60 1 2 6 0

- 1 2 0

6 0

- 6 0

0 0

There were 21 classes.

1. There are 14 words in a hospital. If the total number of patients is 378, how many patients are in each ward?

0 2 7

14 3 7 8

- 2 8

9 8

- 9 8

0 0

There are 27 patients in each ward.

**ACTIVITY**

1. Divide 14620 by 34.
2. A school of 602 pupils needs to split in 14 streams. How many pupils will each stream have?
3. 250 bottles hold 17250 litres of medicine. How much does each bottle hold?
4. 15 men shared sh. 84000. How much did each get?
5. A village has 130 poultry farms with a total of 70850 birds. What is the average number of birds on each farm?
6. A school of 35 classrooms has a population of 1575 pupil. How many pupils are in each stream?
7. Mr. Murine divided his 14.475 acres of land equally among his 5 children. How much did each get?
8. A farmer had 5616 heads of cattle to be shared among his 26 children. How many heads did each get?

**WEEK 8**

**LESSON 1**

**MIXED OPERATIONS**

In this we follow the order / rule called BODMAS

1ST B - Brackets

2nd O - Of

3rd D - Division

4th M - Multiplication

5th A - Addition

6th S - Subtraction

**Example**

1. Work out

2 - 8 + 9 2. 5 x 12 ÷ 4 3. 8 + 7 X 10

= 2 + 9 – 8 BODMAS BODMAS

= 11 – 8 5 X (12 ÷ 4) = 8 + (7 X 10)

= 3 = 5 X 3 = 8 + 70

= 15 = 78

**ACTIVITY**

Work out;

1. ½ of 10 + 15 ÷ 5
2. 28 – ( 4 x 5)
3. 8 ÷ (4 x 2 )
4. 6 ÷ 6 + 2 – 3
5. 18 – (4 x 3 ) ÷ 6
6. (24 + 16) ÷ 15
7. of 40 + of 25
8. 28 ÷ 4 x 2

**LESSON 2**

**SIMPLE STATISTICS**

1. Range – Difference between the highest and lowest.
2. Mode – An item with the highest frequency.
3. Median – The value in the middle of the distribution arranged either in ascending or descending order.
4. Modal frequency – Number of times the mode has appeared.

**EXAMPLE**

Given the figures 10, 5, 10, 15, 20 and 25.

Find;

|  |  |
| --- | --- |
| **No.** | **Freq.** |
| 5 | 1 |
| 10 | 2 |
| 15 | 1 |
| 20 | 1 |
| 25 | 1 |

1. Range b) Mode

= H – L

= 25 – 5

**Range = 5**

**Mode is 10**

1. Median c**) Modal frequency is 2**

5, 10, 10, 15, 20, 25

= 10 + 15 v) Mean

2 = 5 + 10 + 10 +15 + 20 + 25

= 25 6

2  **Mean = 14**

**Median = 12½**

**LESSON 4**

**EXPRESSING BASE FIVE AS BASE TEN**

**EXAMPLE 1**

Change 14five to base ten

1 4five  = 1 4

4 x 1 = 4

1 x 5 =+ 9

1 4

**EXAMPLE 2**

Change 213five to base ten.

2 1 3five to base ten.

3 x 1 = 3

1 X 5 = 5

2 X 5 X 5 = 50

58

**ACTIVITY**

**Change the following to base ten**

1. 13five
2. 22five
3. 32five
4. 22five
5. 44five
6. 104five
7. 241five
8. 321five
9. 313five
10. 2411five

**LESSON 5**

**CHANGING BASE TEN TO BASE FIVE**

**EXAMPLE 1**

1. Change 9 to base five 2. Change 58 to base ten

B No. R B No. R

5 9 4 5 58 3

1 5 11 1

2

9 = 14five 58ten = 213five

**ACTIVITY**

Change the following from base ten to base five

1. 8ten
2. 11ten
3. 15ten
4. 42ten
5. 33five
6. 41ten
7. 55ten
8. 74ten
9. 30ten

**WEEK 9**

**ADDITION IN BASE FIVE**

1. Add: 2five + 1five = 3five 2. 4five  7/5 = 1 rem 2

+3five

1 2five

1. 1 2five 4. 1 3 4five

+ 3 2five +4 3 2five

4 4five 1 0 2 1five

**ACTIVITY**

1. 2five + 2five
2. 32five + 11five
3. 4five + 1five
4. 121five + 212five
5. 13five + 44five
6. 44five + 32five
7. 231five + 44five
8. 330five + 242five

**LESSON 2**

**SUBTRACTION IN BASE FIVE**

**EXAMPLE**

1. 4five – 3five = 1five.  2. 4 1 1five

- 2 2five

3 3 4five

1. 23five - 14five

2 3five

- 1 4five

0 4five

**ACTIVITY**

1. 3five – 2five
2. 21five – 4five
3. 321five – 4five
4. 11five - 4five
5. 42five – 24five
6. 222five – 31five
7. 421five – 111five
8. 240five – 33five
9. 111five – 22five

**LESSON 3**

**THEME: NUMERACY**

**TOPIC: PATTERNS AND SEQUENCES**

**DIVISIBILITY TEST**

1. 2

A number is divisible by 2 if it’s an even number e.g. 0, 2, 4, 6, 8 should be the last digit.

1. 3

A number is divisible by 3 if the sum of its digits is a multiple of 3.

**Number Sum of digits Divisible by**

12 1 + 2 = 3 Yes

22 2 + 2 = 4 No

111 1 + 1 + 1 = 3 Yes

1. 4

A number is divisible by 4 if its last two digits are divisible by 4

**Number Last 2 digits Divisible by**

122 1 2 = 3 4

263 63 Yes

1940 40 No

Yes

1. 5

A number is divisible by 5 if its last digit is 0 or 5

1. 6

A number is divisible by 6 if the sum of its digits is a multiple of 3 and it is an even number.

1. 10

A number is divisible by 10 if its last digit is 0.

**ACTIVITY**

1. Identify by circling the numbers divisible by the following from the given numbers.
2. 2

263, 14, 244, 211,3113

1. 3

63, 241, 1212, 312, 411

1. 4

63,100,1204,407, 222

**LESSON 4**

**MULTIPLES AND LOWEST COMMON MULTIPLES**

**EXAMPLES**

1. Write the multiples of 8 between 20 and 40.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 8 | 8 | 16 | 62 | 32 | 40 | 48 | 56 | 64 | 72 |

Multiples of 8 are

M8 between 20 and 40 are {24, 32}

1. Find the LCM of 4 and 3

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| x | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 3 | 3 | 6 | 9 | 12 | 15 | 18 | 12 | 24 | 27 | 30 |
| 4 | 4 | 8 | 12 | 15 | 20 | 24 | 28 | 32 | 36 | 40 |

The LCM is 12

**ACTIVITY**

1. Find the first 6 multiples of
2. 3
3. 6
4. 10
5. 8
6. 12
7. Find the lowest common multiples of;
8. 3 and 6
9. 5 and 7
10. 6 and 9
11. 14 and 28
12. 8 and 7

**LESSON 5**

Finding factors of numbers.

**Example**

1. How many factors has 12? 2. Find the factors of the following;441

F12 = 1 x 12 = 12 F441 = 1 X 441

= 2 x 6 = 12 3 X 147

= 3 x 4 = 12 9 X 49

F12 = {1, 2, 3, 4, 6, 12} 21 X 21

12 has 6 factors. F441 = {1, 3, 7, 21, 49, 63, 147, 441}

**ACTIVITY**

How many factors has the following

1. 10
2. 26
3. 34
4. 144

Find the factors of the following;

1. 16
2. 24
3. 121
4. 196
5. 125

**WEEK 10: LESSON 1**

**COMMON FACTORS AND HCF / GCF**

**EXAMPLES**

1. Find the common factors of 12 and 15.

F12 F15

1 X 12 1 X 15

2 X 6 3 X 5

3 X 4

**Common factors are {1, 3}**

1. Find the H.C.F of 48 and 60

F48 F60

1 X 6 1 X 60

2 X 24 2 X 30

3 X 16 3 X 20

4 X 12 4 X 15

6 X 8 5 X 12

6 X 10

C.F ARE = {1, 2, 3, 4, 6, 12}

The GCF IS 12

**ACTIVITY**

Find the common factors of the following

1. 6 and 9
2. 24 and 32
3. 50 and 25
4. 36 and 48

Find the GCF of the following

1. 12 and 15
2. 12 and 24
3. 30 and 45
4. 72 and 60

**LESSON 2**

**PRIME NUMBERS AND COMPOSITE NUMBERS**

Number Factors

1 {1}

2 {1, 2}

3 {1, 3}

4 {1, 2, 4}

5 {1, 5}

6 {1, 2, 3, 6}

Those with only two factors are; 2, 3, 5

They are the prime numbers.

Those with more than two factors; 4, 6… are the composite numbers.

**ACTIVITY**

Find the factors of the following and write prime or composite.

1. 25
2. 26
3. 13
4. 32
5. 23
6. 37
7. 44
8. 41

**LESSON 3**

**PRIME FACTORISATION**

Prime factors e.g. 2, 3, 5, 7 … are used when prime factorizing.

We can use any of the two methods.

i.e.

1. Factor tree
2. Ladder method.
3. Prime factors 12 2. Prime factors

12 25

2 5

6 5

2 25 = (5 x 5) multiplication

3 = {51 x 52} set notation

12 = (2 x 2 x 3) product / multiplication = 52 exponential

= {2, 22, 31 } Subscript

= { 22 x 32 } Exponential / Power

**SQUARE NUMBERS AND SQUARE ROOTS**

A Square number is a number got by multiplying a number by itself.

A Square root is a number multiplied by itself to get a square number.

**Square root Square numbers**

1 1 x 1 or 12  1

2 2 x 2 or 22 4

3 3 x 3 or 32 9

4 4 x 4 or 42 16

7 7 x 7 0r 72 49

**Examples**

1. What is the square of 5

= 5 x 5

= 25

1. What is the square of 12

12 x 12

= 144

**ACTIVITY**

Find the squares of the following.

1. 6
2. 8
3. 9
4. 13
5. 15
6. There are 16 pupils in the class. If each child was given the number of books equal to the number of pupils in the class, how many books were given out?
7. If P = 14, what is the value of P2.
8. Find the area of the square whose side is 9cm.

**SQUARE ROOTS**

**EXAMPLE**

Find the square roots of

1. 25 b) 100

5 25 2 100

5 5 2 50

1 5 25

= 5 5 5

1

= 2 x 5

= 10

ACTIVITY

Find the square roots of the following

1. 4
2. 1
3. 64
4. 16
5. 25
6. 36
7. 81
8. 121
9. 256
10. 225
11. 196

**THEME NUMERACY**

**TOPIC: FRACTIONS**

**ADDITION OF FRACTIONS WITH DIFFERENT DENOMINATORS**

**EXAMPLES**

1. +

= =

= = =

+ =

=

1. +

+ =

=

=1

1. + 1 = 1

+ 1 = 1 + +

= 1 +

= 1 + = 1

**ACTIVITY**

Work out the following

1. +
2. +
3. +
4. +
5. +
6. +
7. +
8. +
9. +

**WORD PROBLEMS INVOLVING ADDITION OF FRACTION**

**EXAMPLES**

1. John filled of a tank with water in the morning and in the afternoon. What fraction was filled with the water?

+ = =

1. Adel had 1 Jane had 2 cakes and Rose had of a cake. How many cakes did the three children have?

1 + 2 + = 3 + + +

= 3 +

= 3 +

3 + 2 = 5

**ACTIVITY**

1. Of the seats in a bus are occupied by adults and by children. What fraction of the seats is occupied?
2. A worker painted 3 wall on Monday and of a wall on Tuesday. How much was painted in the two days?
3. In a library of the books are of Math, are of English and are of Science. What fraction do the three groups represent?
4. The daughter got 1 sugarcanes and the son got 2 . How many sugar canes did they get altogether?
5. At Melissa P.S of the day is spent on classroom activities, on Music and on games. Express these as one fraction.
6. A pupil ate of the cake at breakfast and at lunch. What part of the cake did the pupil eat?

**SUBTRACTION OF FRACTIONS**

**EXAMPLES**

1. Subtract -

- =

=

1. -

- =

=

1. 3 - 2

- = = = 1

**ACTIVITY**

Subtract the following fractions

1. -
2. -
3. 3 -
4. -
5. 1 -
6. 1 -
7. 5 – 1
8. 2 - 1
9. 3 - 1
10. 2 -

**WORD PROBLEMS INVOLVING SUBTRACTION OF FRACTIONS.**

**EXAMPLES**

1. A boy was given litres of milk and drunk litres. How much milk remained?

- =

= = litres

1. 2 litres of water removed from a container of 5 litres. How much water remained?

= 5 - 2

= - =

=

= 2 litres

**ACTVITY**

1. A girl had a glass full of water and used of it to take medicine. What fraction of water was left?
2. Ochili was given of a sugar cane. He gave of it to his friend. What fraction of sugarcane did he remain with?
3. A basket is full of fruits. If of them are still green, what fraction of fruits are ripe?
4. Paul had 3 sweets. He gave 1 of them to Andrew. What fraction of sweets did Paul remain with?
5. Betty had to plant of a garden. She planted of it in the morning. What fraction was left for planting?
6. Two children were given 3 cakes. If one of them took 1 . What did the other take?
7. There were 12 bars of soap in a store. If 5 were used, how many remained?
8. There were 5 loaves of bread in a box. A mother used 3 of them. What fraction remained?
9. Of a pole is painted white, if of the white is repainted red. What fraction is left white?

**MULTIPLICATION OF FRACTIONS**

**EXAMPLES**

1. X 3 2. X

X 3 = X =

= 1 =

What is of 1 hour?

= of 60 mins.

= x 60 mins

= 15 minutes

**ACTIVITY**

Work out:

1. x 8
2. x 4
3. of 10
4. of 30
5. x
6. x
7. A man received of his salary. If his salary was sh. 20,000, how much money did he receive?
8. Sempra wants to visit his uncle who lives near Kabale town. The journey to Kabale is 40km away. If his uncle’s home is at of the journey, how far is it in km?

**DIVISION OF FRACTIONS**

**EXAMPLE**

1. 4 ÷ ii ÷

= 4 ÷ = x

= X =

= 12 = 1

**EXAMPLE iii**

How many loaves of bread can be got from 2 loaves?

2 loaves -

= ÷

= x =

= 8 quarter loaves

**ACTIVITY**

**WORK OUT**

1. 2 ÷
2. 3 ÷
3. 4 ÷
4. ÷
5. ÷
6. 1 ÷
7. How many chapatis can you get from 2 whole chapattis?
8. A mother gave cake to each of her children. If she had 3 cakes, how many did she have?
9. A shopkeeper divided 4 bars of soap into pieces each of a bar. How many pieces did he make?
10. How many litre bottles can be filled from a 20 litre jerry can of water?

**THE END**