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P.5

MATHEMATICS

LESSON NOTES

TERM I, 2018

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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. ($\longleftrightarrow$)

-Nonequivalent sets are sets with different number of elements or members. ($\not\longleftrightarrow$)

A = {1, 2, 3}

B = {4, 6, 7}

C = {6, 4, 7, 8}

A $\longleftrightarrow$ B / Set A is equivalent to set B

B $\not\longleftrightarrow$ C / Set B and C are non-equivalent

ACTIVITY

a) Which of the following pairs of sets are equivalent?

a) A = { Kato, Wasswa, Okello }
B = { Adikini, Amoti, Chandiru }

b) C = {the letters of the word Uganda.}
D = {The letters of the word, Africa)

c) E = { Odd numbers less than 10
F = {Fish, Meat, clouds}

d) 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 ----------.

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b) 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

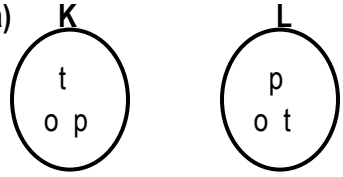
-Equal sets are sets with same number of elements which are exactly alike (=)
-Non-equal sets re sets with the same number of different number of elements not exactly alike (≠)

EXAMPLE

A = {1, 2, 3} Set A = Set C
B = {2, 3, 4} Set B ≠ Set C
C = {3, 2, 1}

ACTIVITY

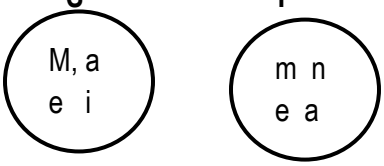
a) **K** **L**



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

b) P = { 2, 6, 7 } Q = { 1, 5, 3 }
Set P and Q are ----------

c) **S** **T**

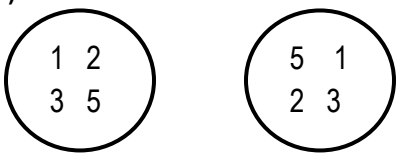


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Set S and Set T are ----------

d) **M** **N**



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

2. Which of the following pairs are equal?

a) A = { a, b, c, d }
B = {b, c, a, d}

b) C = { cat, dog, rat }
D = {rat, dog, cat}

c) E = { fish, banana, meat }
F = {fish, potatoes, meat}

d) K = { 0, 2, 4, 6 }
L = {6, 0, 4, 2}

e) 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 Ø 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

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1. State whether the sets below are empty or not.
   a) B = {girls who are as old as their mothers.}
   b) F = {A cow which can fly like an airplane}
   c) K = { A bull which lays eggs }
   d) P = { An animal which lays eggs }
   e) C = { Birds which produce milk }
   f) 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

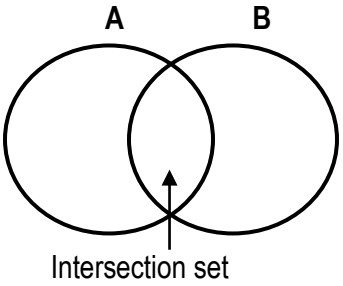
COMPETENCE: LANGUAGE – Describes intersection of sets

SUBJECT – Identifies the intersection region

-- Identifies the elements in the intersection region

CONTENT

INTERSECTION OF SETS



The symbol" ∩" is used to mean intersection.

It is the region / set of common elements

EXAMPLE

1. Q = {a, b, c, d, e, f}
   P = {a, e, I, o, u}
   Find P ∩ Q
   = {a, e}

2. K = {e, q, a, t }
   L = {e, q, u, a, l}
   Find K ∩ L
   = {e, q, a}

ACTIVITY

Find the intersection of the following pair of sets.

a) A = { book, pen, table, chair }
   B = {house, bed, table, mat, chair}

b) C = { hat, shorts, shirts }
   D = {jacket, shirt, coat}

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c) E = { 1, 3. 5, 7, 9, 11 }
F = {1, 2, 5, 8, 9, 10}

d) G = { a, e, I, o, u }
H = { a, r, c, h, e }

e) I = { a, b, c, d, e }
J = { 1, 2, 3, 4, 5 }

K = {○, △, □}

L = {△, □, ▭}

REFERENCE:

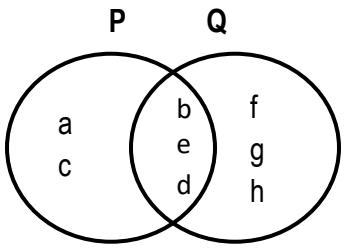
-Functional p/math book 5 pages 5 and 6
- A new MK pupils Bk 5 page 5
- Bk 4 pg 9, 10, 11

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
   i. P ∩ Q
   ii. P ∪ Q

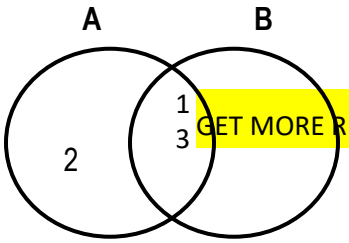


P ∩ Q = {b, e, d}

P ∪ Q = {a, b, c, d, e, f, g, h}

2. Represent the following sets on a Venn diagram and find;
   i. A ∩ B
   ii. B ∪ A

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



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A ∩ B = {1, 3}

A ∪ B = {1, 2, 3, 4, 5, 6,}

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4 5
6 9

ACTIVITY

1. Represent the following sets on a Venn diagram and find:
- **i.** C ∩ D
- **ii.** C ∪ D

a) C = { Monday, Tuesday, Wednesday, Thursday } D = {Monday, Thursday, Friday, Saturday}

b) C = {Z, K,L, M } D= { I, k, l }

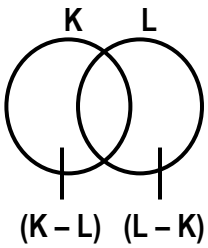
c) C = { 10, 11, 12, 13, 15 } D = { 8, 10, 12, 14, 16 }

d) C = { c, r, a, w, l } D = { j, a, c, k, w, a, l }

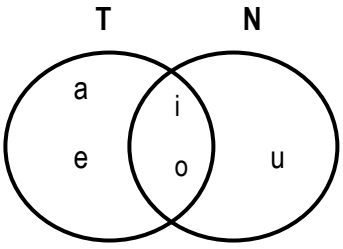
WEEK 2

LESSON 1

DIFFERENCE OF SETS



EXAMPLE



List members of;
- iii) T – V = { a, e}
- iv) V – T = { U }

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EXAMPLE

Given that; R = {9, 2, 4, 6, 8}
S = {4, 3, 5, 7, 9}

i. 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}

   a) Represent the information on the Venn diagram.
   b) Find i) P – Q
      ii) Q – R

2. M = { 2, 4, 5, 6 }
   N = {5, 6, 7, 8}
   a) Represent the information on a Venn diagram
   b) Find i) M – N
      ii) N – M

3. 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

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EXAMPLE 2

Given that K = {2, 4, 6, 8}
L = {1, 2, 3, 4, 5, 6}

Find:

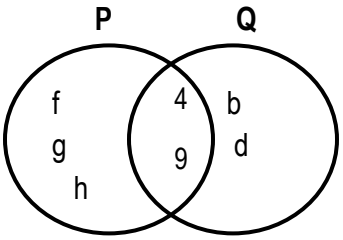
a) n (L)
L = {1, 2, 3, 4, 5, 6}
N (L) = 6

b) n (L ∩ K)
L ∩ K = {2, 4, 6}
n (L ∩ K) = 3

c) N (K – L)
K – L = {8}
N (K – L) = 1

ACTIVITY

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



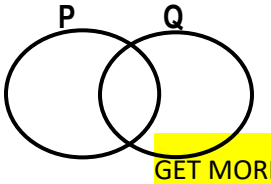
Find;
a) n (P ∩ Q)
b) n (P ∩ Q)
c) n (Q)
d) n (P)
e) n(Q – P)

2. Given that M = { 1, 2, 3, 4, 5, 6, 7 }
N = { 1, 3, 5, 7, 9, 11 }
   a) Represents the information on a Venn diagram
   b) Find;
      i. n (M)
      ii. n (N – M)
      iii. n (N ∪ M)
      iv. n (N ∩ M)
      v. n (M – N)

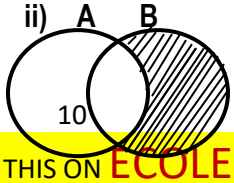
LESSON 3

DESCRIBING REGIONS ON THE VENN DIAGRAM
EXAMPLE

i)



ii)



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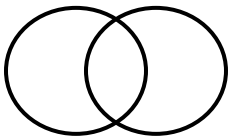
Set Q

Set B only or B- A

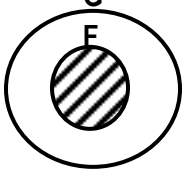
ACTIVITY

Describe the shaded parts

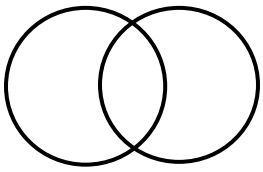
i)



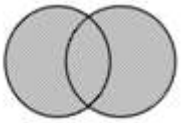
ii)



iii)

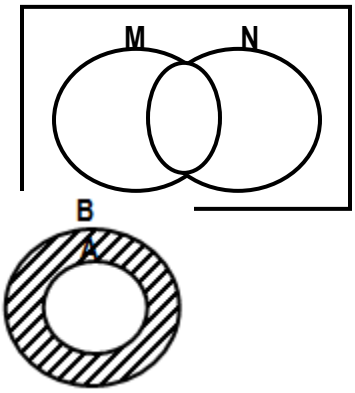


iv)



v)

vi)



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 }

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= 8 Subsets

OR

No. of subsets = 2^n

Where n = number of elements.

= 2^3

= 2 x 2 x 2

= 8 elements

EXAMPLE 2

a) 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 }

b) How many subsets had P?

No. of subsets = 2^n

= 2^4

` = 2 x 2 x 2 x 2

= 16 Subsets

EXERCISE

1. List down number of subsets in the following sets.
   a) A = { 1, 2 }
   b) B = {x, y, z }
   c) C = { I, o , u }
2. Find the number of subsets in the following sets
   a) K = { }
   b) M = { 1 }
   c) Q = { a, b }
   d) P = { daddy, mummy, uncle }

LESSON 5

PROPER SUBSETS

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

EXAMPLE

1. Find the number of proper subsets in

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

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$= 2^n - 1$

$= 2^6 - 1$

$= (2 \times 2 \times 2 \times 2 \times 2 \times 2)$

$=(\{4 \times 4) - 1$

$= 64 - 1$

= 63 proper subsets.

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

   $= 2^n - 1$

   $= 2^8 - 1$

   $= 2 \times 2 \times 2 \times 2 \times 2 \times 2) - 1$

   $= 64 - 1$

   = 63 subsets

ACTIVITY

Find the number of proper subsets in the following.

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

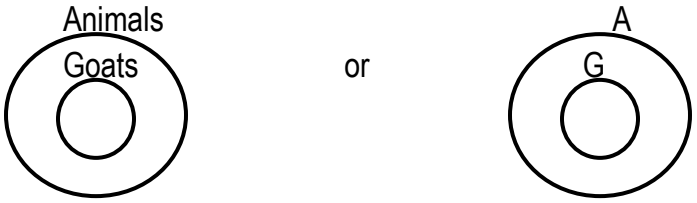
WEEK 3

LESSON 1

Representing subsets on Venn diagrams.

EXAMPLE

Draw a Venn diagram to show that all goats are animals



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

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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. = $\frac{n\,(Dc)}{n\,(tc)}$

Prob. = $\frac{1}{2}$

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;

a) Odd numbers show up

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

   Odd numbers are { 1, 3, 5 }

   Prob. $\frac{3}{6}$

b) Prime numbers show up?

   1, 2, 3, 4, 5, 6

   Prime numbers are 2, 3, and 5?

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Prob. = $\frac{3}{6}$

ACTIVITY

1. Simon tossed a coin once. What is the probability of getting;
   a) A head on top?
   b) A tail on top?
2. The dice is rolled once. What is the probability that;
   a) An even number shows up?
   b) A multiple of 2 shows up?
   c) A multiple of 3 shows up?
   d) A composite number shows?
   e) A triangular number shows up?
   f) A number less than 5 shows up?
   g) 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. = $\frac{n\,(DC)}{n\,(T.C\,)}$

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

   Prob. = $\frac{2}{5}$

2. 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. = $\frac{n\,(DC)}{n\,(T.C\,)}$

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Prob. = $\frac{2}{7}$

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 $\frac{3}{4}$. What is the probability that he will fail.
6. The probability that the Cranes will win is $\frac{3}{5}$. What is the probability that it will loose?

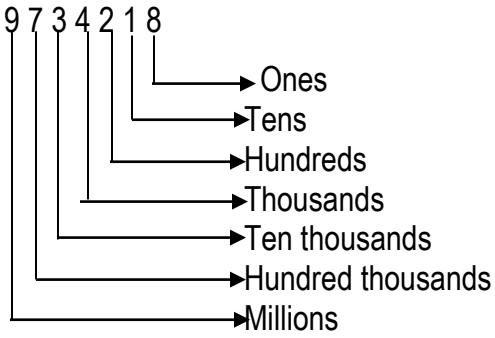
THEME: NUMERACY

TOPIC: WHOLE NUMBERS

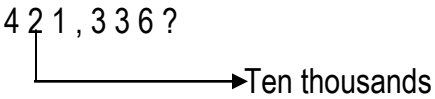
LESSON 4

EXAMPLE

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



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



ACTIVITY

1. What is the place value of each digit in the numbers below?
   a) 4 3 1 2 26
   b) 7 5 6 0 8 2

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c) 2 5 6 0 7 0

d) 1 6 8 4 7 9

e) 1 4 6 8 5 0 3

2. Write the place value of the underlined digit in each of the following?

a) 9 7 <u>3</u> 4 2

b) 3 9 <u>0</u> 7 00

c) 2 6 3 <u>1</u> 4 7

d) <u>1</u> 6 1 1 1 2 1

e) 2 3 4 5 <u>6</u> 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

2. What is the value of 6 in the number 2 <u>6</u> 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?

a) 2 3 7 2

b) 1 4 9 3

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c) 4 2 6 3 8

d) 1 0 2 3 4 2 6

e) 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

2. 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

3. 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

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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.
   a) 3 4 5 0
   b) 8 5 3 2 1
4. Find the product of the value of the underlined digit in;
   a) 8 9 3 b) 8 5 3 2 1
5. Work out the quotient of the value of 6 and 1 in 6 3 2 1 0
6. 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
	3	2
6	1	3

Thousand

= 3 2, 6 1 3

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

H	T	O
1	0	9
0	3	4

Thousand

= 1 0, 9 0 3 4

ACTIVITY

Write the following in words.

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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	3	7
2	0	6

Thousand

= Two hundred thirty seven thousand, two hundred six.

2. 9 9, 1 1 4

	9	9
1	1	4

Thousand

= Ninety nine thousand, one hundred fourteen.

ACTIVITY

1. Write each of the following in figures;
   a) 4021
   b) 2,018

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NOTE

1. Identify major place values.
2. Write the numerical quantities left.
3. Draw a box for major place values

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c) 13,419
d) 14,999
e) 49,114
f) 111,111
g) 70,707
h) 800,800
i) 9,999,114
j) 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)

2. 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.

   a) 89
   b) 872
   c) 15,301
   d) 2873
   e) 19972
   f) 8261
   g) 992,789
   h) 120,203
   i) 600,742
   j) 178,109

LESSON 5

EXPANDING NUMBERS USING VALUES

EXAMPLES

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1. Expand 4532 using values;

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

   = 4000 + 500 + 30 + 2

2. 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

$7^2\ 8^1\ 9^0 = (7 \times 10^2) + (8 \times 10^2) + (8 \times 10^1) + (9 \times 10^0)$

2. Write 9381 in expanded form using powers of 10

   $(9 \times 10^3) + (3 \times 10^2) + (8 \times 10^1) + (1 \times 10^0)$

ACTIVITY

Write each of the following in expanded form using exponents.

a) 493
b) 6785
c) 938102
d) 723601

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e) 12684
f) 100242
g) 13684
h) 3819420
i) 485001
j) 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

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

$$\begin{array}{r} 30000 \\ 600 \\ +\quad 4 \\ \hline 30604 \end{array}$$

3. Write $(4 \times 10^3) + (1 \times 10^1) + (2 \times 10^2) + (8/ \times 10^0)$ as a single numeral.

$$\begin{array}{lll} 4 \times 10^3 = 4 \times 1000 & = & 4\,0\,0\,0 \\ 1 \times 10^1 = 1 \times 10 & = & 1\,0 \\ 2 \times 10^2 = 2 \times 100 & = & 2\,0\,0 \\ 8 \times 10^0 = 8 \times 1 & = & +\quad 8 \\ & = & 4\,2\,1\,8 \end{array}$$

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. $(8 \times 10^4) + (7 \times 10^3) + (4 \times 10^2) + (3 \times 10^1) + (4 \times 10^0)$

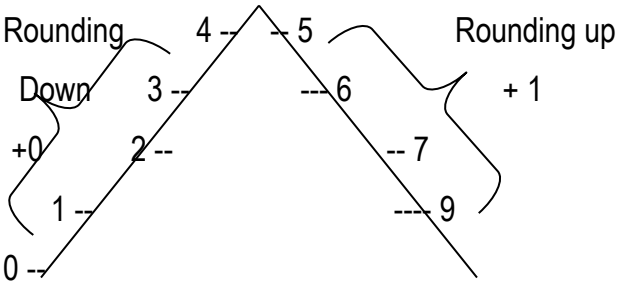
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5. (2 x 100000 0 + (2 x 100)+ (6 x 1) + (4 x 10)
6. 9000 + 70
7. (2 x 10^5) + (6 x 10^0)

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

a) ROUNDING OFF TO THE NEAREST TENS

EXAMPLE

1. 74

```
   7  4
+  0 ←
-------
≃  7  0
```

74 ≃ 70

2. 88.

```
   8  8
      1 ←
-------
≃  9  0
```

Therefore 88 ≃ 90

```
   9  4  8
+  1 ←
-------
   9  5  0
-------
```

948 ≃ 950

ACTIVITY

Round off the following to the nearest tens.

a) 24
b) 42
c) 67
d) 156
e) 245
f) 134
g) 178
h) 9541
i) 4629

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j) 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.

a) 136
b) 421
c) 363
d) 412
e) 1534
f) 1247
g) 2372
h) 3613
i) 9514

LESSON 5

ROUNDING OFF TO THE NEAREST THOUSANDS

EXAMPLE

1. 4 3 4 0 4 3 4 0 ∴ 4340 ≃ 4000

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$$\begin{array}{r} +0 \leftarrow \\ \hline 4\ 0\ 0\ 0 \\ \hline \end{array}$$

2. 7 6 9 4 $\qquad$ 7 6 9 4 $\qquad$ $\therefore$ 7694 $\simeq$ 8000

$$\begin{array}{r} +1 \\ \hline 8\ 0\ 0\ 0 \\ \hline \end{array}$$

ACTIVITY

Round off the following to the nearest thousands

a) 1240
b) 3408
c) 5631
d) 3941
e) 58244
f) 6815
g) 11242
h) 26041
i) 68514
j) 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

2. Numbers which show repeated Roman numerals.

2 3 20 30 200 300

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II III XX XXX CC M

3. 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

4. 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.

a) 2 5 = 20 + 5
= XX + V
= XXV

b) 5 7 = 50 + 7
= L + VII
= LVII

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C) 4 9 = 40 + 9
= XL + IX
= **XLIX**

d) 8 6 4 = 800 + 60 + 4
= DCCC + LX + IV
= **DCCCLXIV**

ACTIVITY

EXPRESS THE FOLLOWING AS ROMAN NUMERALS

a) 29
b) 24
c) 14
d) 99
e) 31
f) 189
g) 242
h) 325
i) 483
j) 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

X I X = X + IX
= 10 + 9
= **19**

2. X L I V

X L I V = XL + IV
= 40 + 4
= **44**

3. L I V

L I V = L + IV

4. C D I V

C D I V = CD + IV

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= 50 + 4 = 400 + 4

= 54 **= 404**

5. 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 = $\overline{V}$

2. 30,000

   30000 = $\overline{XXX}$

ACTIVITY

Write the following as Roman numerals.

1. 4000
2. 6000
3. 7000
4. 8000
5. 94000
6. 24000

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7. 55,263

8. 44,263

LESSON 4

OPERATION ON ROMAN NUMERALS

EXAMPLE

1. Add L X X + X I I

   = L + XX + X + IX

   = 50 + 20 + 10 + 9

   = 70 + 19

   = 89

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

ACTIVITY

1. Work out
   i. L X X X I V
   ii. C C C L V – C X L V
   iii. X X X + X X V
   iv. L X X V I ÷ II
2. Amos was born in MCLXXII and married after XXV years. In which year did he get married?
3. Moses was born XXV, how old was he in $\overline{X\ X}\ X$?
4. 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

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2. 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

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$$\begin{array}{r} 3\,6\,7\,4\,9 \\ -\quad 8\,6\,8\,9\,4 \\ \hline \end{array}$$

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

$$\begin{array}{r} 3\,6\,7\,0\,1\,5 \\ -\;3\,4\,6\,7\,2\,9 \\ \hline 0\,2\,0\,2\,8\,6 \\ \hline \end{array}$$

ACTIVITY

1. $\begin{array}{r} 1\,2\,3\,6\,4\,5 \\ -\quad\;\; 2\,3\,4\,8 \\ \hline \\ \hline \end{array}$

2. $\begin{array}{r} 2\,7\,4\,8\,6\,3 \\ -\quad 5\,2\,6\,8\,4 \\ \hline \\ \hline \end{array}$

3. $\begin{array}{r} 9\,4\,5\,4\,5\,6 \\ -\;1\,8\,\;3\,4\,8 \\ \hline \\ \hline \end{array}$

4. $\begin{array}{r} 1\,3\,4\,5\,6\,7 \\ -\;4\,5\,3\,2\,5 \\ \hline \\ \hline \end{array}$

5. A water tank holds 100,000 litres of water. If 36,190 litres are used, how much water is left in the tank?
6. Farmer planted 298,770 seedlings of coffee, 112,429 trees did not grow, and how many trees grew up?
7. 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?
8. The distance between two airports is 123,908 km. If a plane had covered 99,045 km only. What distance was left?
9. A filling station sold 404,560 litres of petrol of the 987,403 litres in the tank. How much fuel was left?

LESSON 2

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MULTIPLICATION BY 2 DIGIT NUMBERS

EXAMPLES

1.
$$\begin{array}{r} 35 \\ \times\ 2 \\ \hline 70 \\ +35 \\ \hline 420 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 249 \\ \times\ 32 \\ \hline 458 \\ +\ 747 \\ \hline 7928 \\ \hline \end{array}$$

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?

$$\begin{array}{r} 26 \\ \times\ 15 \\ \hline 130 \\ +\ 260 \\ \hline 390 \text{ tiles} \\ \hline \end{array}$$

2. 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?

$$\begin{array}{r} 146 \text{ rows} \\ \times\ 27 \text{ (Scouts and girl guides)} \end{array}$$

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$$\begin{array}{r} 1\ 0\ 2\ 2 \\ +\ 2\ 9\ 2\ 0 \\ \hline 3\ 9\ 4\ 2 \end{array}$$

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.

$$\begin{array}{r} 0\ 4\ 5\ 2 \\ 12\overline{)\ 5\ 4\ 2\ 4} \\ \underline{4\ 8\downarrow\ \ } \\ 6\ 2\ \ \\ \underline{6\ 0\downarrow\ \ } \\ 2\ 4\ \ \\ \underline{-\ 2\ 4} \\ 0\ 0 \end{array}$$

= 4 5 2

2. Divide 3000 by 25

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```
      0  1  2  0
   ____________
25 | 3 0 0 0
   - 2 5
     5 0
   - 5 0
       0 0
     - 0 0
       - -
```

= 120

ACTIVITY

1. 11 | 1352

2. 14 | 33054

3. 18 | 61557

4. 14 | 29862

5. 15 | 18615

6. 18 | 18648

7. 12 | 1440

8. 17 | 1428

9. 17 | 22457

10. 23 | 1428

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
   ____________
```


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```
60   1 2 6 0
   - 1 2 0
       6 0
     - 6 0
       0 0
```

There were 21 classes.

2. 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

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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 + 9 – 8

   = 11 – 8

   = 3

2. 5 x 12 ÷ 4

   BODMAS

   5 X (12 ÷ 4)

   = 5 X 3

   = 15

3. 8 + 7 X 10

   BODMAS

   = 8 + (7 X 10)

   = 8 + 70

   = 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. $\frac{3}{4}$ of 40 + $\frac{2}{5}$ 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.

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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;

a) Range

= H – L

= 25 – 5

Range = 5

b) Mode

No.	Freq.
5	1
10	2
15	1
20	1
25	1

Mode is 10

b) Median

5, 10, 10, 15, 20, 25

$= \frac{10 + 15}{2}$

$= \frac{25}{2}$

Median = 12½

c) **Modal frequency is 2**

v) Mean

$= \frac{5 + 10 + 10 + 15 + 20 + 25}{6}$

Mean = $14\frac{1}{6}$

LESSON 4

EXPRESSING BASE FIVE AS BASE TEN

EXAMPLE 1

Change 14_{five} to base ten

$1\ 4_{five} = 1\ 4$

4 x 1 = 4

1 x 5 =+ 9

1 4

EXAMPLE 2

Change 213five to base ten.

$2\ 1\ 3_{five}$ to base ten.

3 x 1 = 3

1 X 5 = 5

2 X 5 X 5 = 50

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ACTIVITY

Change the following to base ten

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

LESSON 5

CHANGING BASE TEN TO BASE FIVE

EXAMPLE 1

1. Change 9 to base five

B	No.	R
5	9	4
	1	

$9 = 14_{five}$

2. Change 58 to base ten

B	No.	R
5	58	3
5	11	1
	2	

$58_{ten} = 213_{five}$

ACTIVITY

Change the following from base ten to base five

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

WEEK 9

ADDITION IN BASE FIVE

1. Add: $2_{five} + 1_{five} = 3_{five}$
2. 4_{five} $^{7}/_{5}$ = 1 rem 2

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$$\begin{array}{r} +\ 3_{five} \\ \hline 1\ 2_{five} \\ \hline \end{array}$$

3.
$$\begin{array}{r} 1\ 2_{five} \\ +\ 3\ 2_{five} \\ \hline 4\ 4_{five} \\ \hline \end{array}$$

4.
$$\begin{array}{r} 1\ 3\ 4_{five} \\ +4\ 3\ 2_{five} \\ \hline 1\ 0\ 2\ 1_{five} \\ \hline \end{array}$$

ACTIVITY

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

LESSON 2

SUBTRACTION IN BASE FIVE

EXAMPLE

1. $4_{five} - 3_{five} = 1_{five.}$

2.
$$\begin{array}{r} 4\ 1\ 1_{five} \\ -\ 2\ 2_{five} \\ \hline 3\ 3\ 4_{five} \\ \hline \end{array}$$

3. $23_{five} - 14_{five}$

$$\begin{array}{r} 2\ 3_{five} \\ -\ 1\ 4_{five} \\ \hline 0\ 4_{five} \\ \hline \end{array}$$

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ACTIVITY

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

LESSON 3

THEME: NUMERACY

TOPIC: PATTERNS AND SEQUENCES

DIVISIBILITY TEST

a) 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.

b) 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

c) 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

d) 5

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

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e) 6

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

f) 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.
   a) 2
      263, 14, 244, 211,3113

   b) 3
      63, 241, 1212, 312, 411

   c) 4
      63,100,1204,407, 222

LESSON 4

MULTIPLES AND LOWEST COMMON MULTIPLES

EXAMPLES

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

Multiples of 8 are

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

M_8 between 20 and 40 are {24, 32}

2. 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
   a) 3
   b) 6
   c) 10
   d) 8
   e) 12

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2. Find the lowest common multiples of;
   a) 3 and 6
   b) 5 and 7
   c) 6 and 9
   d) 14 and 28
   e) 8 and 7

LESSON 5

Finding factors of numbers.

Example

a) How many factors has 12?

F_{12} = 1 x 12 = 12
= 2 x 6 = 12
= 3 x 4 = 12
F_{12} = {1, 2, 3, 4, 6, 12}
12 has 6 factors.

2. Find the factors of the following;441

F_{441} = 1 X 441
3 X 147
9 X 49
21 X 21
F_{441} = {1, 3, 7, 21, 49, 63, 147, 441}

ACTIVITY

How many factors has the following
   a) 10
   b) 26
   c) 34
   d) 144

Find the factors of the following;
   a) 16
   b) 24
   c) 121
   d) 196
   e) 125

WEEK 10: LESSON 1

COMMON FACTORS AND HCF / GCF

EXAMPLES

1. Find the common factors of 12 and 15.

F_{12}	F_{15}
1 X 12	1 X 15
2 X 6	3 X 5

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3 X 4

Common factors are {1, 3}

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

F_{48}	F_{60}
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

5. 12 and 15
6. 12 and 24
7. 30 and 45
8. 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

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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.

a) 25
b) 26
c) 13
d) 32
e) 23
f) 37
g) 44
h) 41

LESSON 3

PRIME FACTORISATION

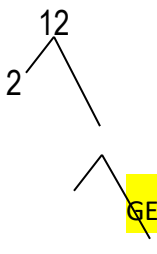
Prime factors e.g. 2, 3, 5, 7 … are used when prime factorizing.

We can use any of the two methods.

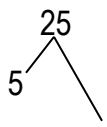
i.e.

i) Factor tree
j) Ladder method.

1. Prime factors 12



2. Prime factors



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6

2

3

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

= {2, 2_2, 3_1 } Subscript

= { 2^2 x 3^2 } Exponential / Power

5

25 = (5 x 5) multiplication

= {51 x 5_2} set notation

= 5^2 exponential

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 1^2	1
2	2 x 2 or 2^2	4
3	3 x 3 or 3^2	9
4	4 x 4 or 4^2	16
7	7 x 7 0r 7^2	49

Examples

1. What is the square of 5

   = 5 x 5

   = 25

2. What is the square of 12

   12 x 12

   = 144

ACTIVITY

Find the squares of the following.

1. 6
2. 8

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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 P^2.
8. Find the area of the square whose side is 9cm.

SQUARE ROOTS

EXAMPLE

Find the square roots of

a) 25

5	25
5	5
	1

= 5

b) 100

2	100
2	50
5	25
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

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1. $\frac{1}{4} + \frac{1}{2}$

$\frac{1}{4} = \frac{2}{8} = \frac{3}{12}$

$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$

$\frac{1}{4} + \frac{2}{4} = \frac{1+2}{4}$

$= \frac{3}{4}$

2. $\frac{5}{6} + \frac{3}{8}$

$\frac{5}{6} + \frac{3}{8} = \frac{20+9}{24}$

$= \frac{29}{24}$

$= 1\frac{5}{24}$

3. $\frac{1}{15} + 1\frac{1}{3} = 1\frac{2}{5}$

$\frac{1}{\mathbf{15}} + 1\frac{1}{3} = 1 + \frac{1}{15} + \frac{1}{3}$

$= 1 + \frac{1+5}{15}$

$= 1 + \frac{6}{15} = 1\frac{2}{5}$

ACTIVITY

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Work out the following

1. $\frac{1}{3}+\frac{1}{2}$
2. $\frac{2}{5}+\frac{1}{6}$
3. $\frac{5}{8}+\frac{1}{6}$
4. $\frac{3}{4}+\frac{1}{2}$
5. $\frac{2}{3}+\frac{1}{5}$
6. $\frac{1}{5}+\frac{1}{2}$
7. $\frac{1}{7}+\frac{2}{3}$
8. $\frac{1}{5}+\frac{3}{4}$
9. $\frac{2}{9}+\frac{1}{6}$

WORD PROBLEMS INVOLVING ADDITION OF FRACTION

EXAMPLES

1. John filled $\frac{1}{2}$ of a tank with water in the morning and $\frac{2}{3}$ in the afternoon. What fraction was filled with the water?

$$\frac{1}{2}+\frac{2}{3}=\frac{5+4}{10}=\frac{9}{10}$$

2. Adel had $1\frac{1}{2}$ Jane had $2\frac{3}{4}$ cakes and Rose had $\frac{3}{4}$ of a cake. How many cakes did the three children have?

$$1\frac{1}{2}+2\frac{3}{4}+\frac{3}{4}=3+\frac{1}{2}+\frac{3}{4}+\frac{3}{4}$$

$$=3+\frac{2+3+3}{4}$$

$$=3+\frac{8}{4}$$

$$3+2=5$$

ACTIVITY

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1. $\frac{2}{3}$ Of the seats in a bus are occupied by adults and $\frac{1}{4}$ by children. What fraction of the seats is occupied?
2. A worker painted $3\frac{1}{9}$ wall on Monday and $\frac{4}{9}$ of a wall on Tuesday. How much was painted in the two days?
3. In a library $\frac{5}{15}$ of the books are of Math, $\frac{1}{6}$ are of English and $\frac{1}{3}$ are of Science. What fraction do the three groups represent?
4. The daughter got $1\frac{1}{2}$ sugarcanes and the son got $2\frac{1}{4}$. How many sugar canes did they get altogether?
5. At Melissa P.S $\frac{2}{3}$ of the day is spent on classroom activities, $\frac{3}{12}$ on Music and $\frac{1}{8}$ on games. Express these as one fraction.
6. A pupil ate $\frac{1}{3}$ of the cake at breakfast and $\frac{1}{2}$ at lunch. What part of the cake did the pupil eat?

SUBTRACTION OF FRACTIONS

EXAMPLES

1. Subtract $\frac{4}{5} - \frac{1}{5}$

$\frac{4}{5} - \frac{1}{5} = \frac{4\ 1}{5}$

$= \frac{3}{5}$

2. $\frac{1}{2} - \frac{1}{3}$

$\frac{1}{2} - \frac{1}{3} = \frac{3-2}{6}$

$= \frac{1}{6}$

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3. $3\frac{1}{2} - 2\frac{1}{4}$

$\frac{7}{2} - \frac{9}{4} = \frac{14-9}{4} = \frac{5}{4} = 1\frac{1}{4}$

ACTIVITY

Subtract the following fractions

1. $\frac{4}{5} - \frac{1}{5}$
2. $\frac{5}{6} - \frac{1}{6}$
3. $3 - \frac{1}{2}$
4. $\frac{7}{5} - \frac{4}{6}$
5. $1\frac{2}{5} - \frac{4}{5}$
6. $1\frac{1}{10} - \frac{1}{2}$
7. $5 - 1\frac{1}{2}$
8. $2\frac{3}{8} - 1\frac{1}{8}$
9. $3\frac{3}{4} - 1\frac{1}{4}$
10. $2\frac{1}{2} - \frac{1}{3}$

WORD PROBLEMS INVOLVING SUBTRACTION OF FRACTIONS.

EXAMPLES

1. A boy was given $\frac{5}{6}$ litres of milk and drunk $\frac{7}{12}$ litres. How much milk remained?

$\frac{5}{6} - \frac{7}{12} = \frac{10-7}{12}$

$= \frac{3}{4} = \frac{1}{4}$ litres

2. $2\frac{1}{2}$ litres of water removed from a container of $5\frac{1}{4}$ litres. How much water remained?

$= 5\frac{1}{4} - 2\frac{1}{2}$

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$= \frac{21}{4} - \frac{5}{2} = \frac{21-10}{4}$

$= \frac{11}{4}$

$= 2\frac{3}{4}$ litres

ACTVITY

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

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MULTIPLICATION OF FRACTIONS

EXAMPLES

1. $\frac{1}{3}$ X 3

   $\frac{1}{3}$ X 3 = $\frac{1\ X\ 3}{3}$

   = $\frac{3}{3}$ = 1

2. $\frac{1}{2}$ X $\frac{1}{2}$

   $\frac{1}{2}$ X $\frac{1}{2}$ = $\frac{1\ X\ 1}{2}$

   = $\frac{1}{4}$

What is $\frac{1}{4}$ of 1 hour?

= $\frac{1}{4}$ of 60 mins.

= $\frac{1}{4}$ x 60 mins

= 15 minutes

ACTIVITY

Work out:

1. $\frac{1}{4}$ x 8
2. $\frac{1}{4}$ x 4
3. $\frac{1}{2}$ of 10
4. $4\ \frac{5}{10}$ of 30
5. $\frac{1}{4}$ X $\frac{5}{7}$
6. $\frac{1}{10}$ X $\frac{1}{3}$
7. A man received $\frac{9}{10}$ 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 $\frac{7}{8}$ of the journey, how far is it in km?

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DIVISION OF FRACTIONS

EXAMPLE

i. $4 \div \frac{1}{3}$

$= 4 \div \frac{1}{3}$

$= \frac{4}{1} \times \frac{3}{1}$

$= 12$

ii $\frac{1}{4} \div \frac{1}{6}$

$= \frac{1}{4} \times \frac{6}{1}$

$= \frac{6}{4}$

$= 1\frac{1}{2}$

EXAMPLE iii

How many $\frac{1}{4}$ loaves of bread can be got from 2 loaves?

2 loaves - $\frac{1}{4}$

$= \frac{2}{1} \div \frac{1}{4}$

$= \frac{2}{1} \times \frac{4}{1} = \frac{8}{1}$

= 8 quarter loaves

ACTIVITY

WORK OUT

1. $2 \div \frac{1}{3}$
2. $3 \div \frac{3}{4}$
3. $4 \div \frac{1}{5}$
4. $\frac{1}{4} \div \frac{2}{5}$
5. $\frac{3}{8} \div \frac{4}{5}$
6. $1\frac{1}{2} \div \frac{1}{2}$
7. How many $\frac{1}{3}$ chapatis can you get from 2 whole chapattis?

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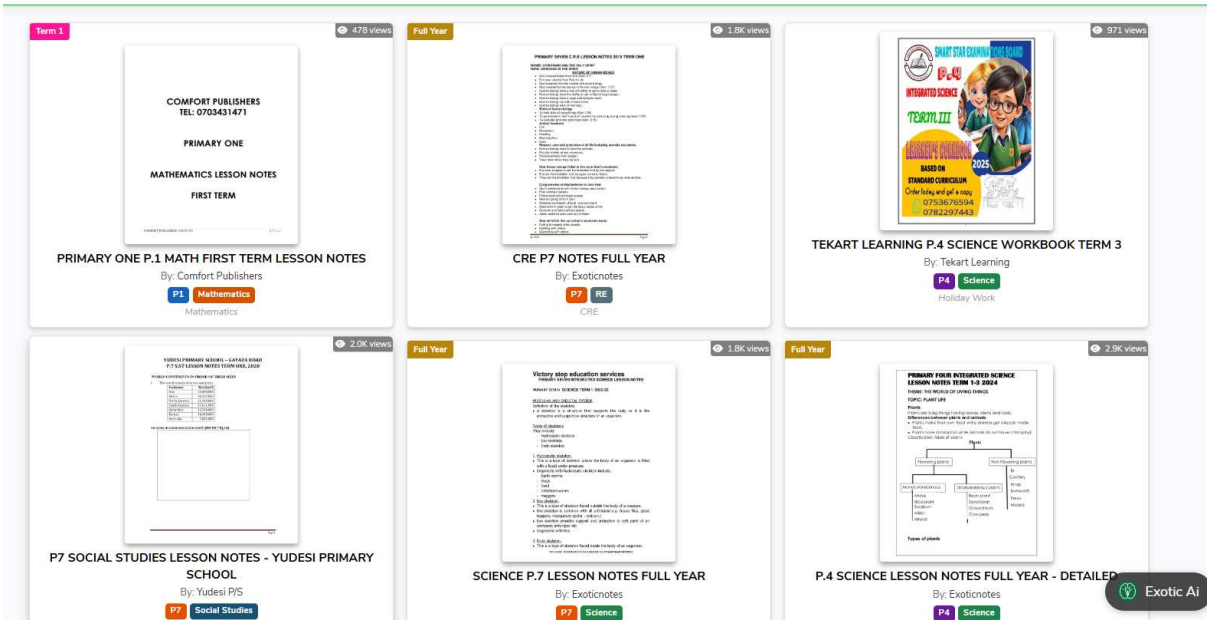
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8. A mother gave $\frac{1}{4}$ cake to each of her children. If she had 3 cakes, how many did she have?
9. A shopkeeper divided 4 bars of soap into pieces each $\frac{1}{6}$ of a bar. How many pieces did he make?
10. How many $\frac{1}{2}$ litre bottles can be filled from a 20 litre jerry can of water?

THE END

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