PRIMARY

SIX

MATHEMATICS

LESSON

NOTES

PRIMARY SIX MATHEMATICS LESSON NOTES TERM ONE, 2020

LESSON : 1

TOPIC : SET CONCEPTS

SUBTOPIC : EQUAL AND EQUIVALENT SETS

CONTENT :

Equal Sets

Equal sets are sets with the same number of elements of the same type. The symbol = is used to denote equal sets.

Example:

1. If set R = {r, a, t} and set P = {t, a, r}

   N(R) = 3 members, n(S) = 3 members.

   Members of R and S are similar

   Sets R and P are therefore equal sets.

   So we write; **R = P**

   N.B: The arrangement of members does not matter provided they are exactly the same.

Equivalent Sets

Equivalent sets are sets with the same number of elements. The members may be different or the same. The symbol for equivalent is $\longleftrightarrow$.

Examples:

Set B = {4, 5, 6, 7, 8} and Set C = {a, b, c, d, e}

n (B) = 5 members n (C) = 5 members

Therefore Sets B and C are equivalent since they both have 5 members each.

They can be written as, **B $\longleftrightarrow$ C**

ACTIVITY

a) Define equal sets.

b) What are equivalent sets?

c) Given the sets below,

Set A = {0, 2, 4, 6, 8}

Set B = {2, 4, 6, 8, 10, 12, 14}

Set C = {s, n, a, i, l}

Set D = {4, 6, 8, 0, 2}

Set E = {n, a, i, l, s}

Set F is of even numbers between 1 and 15.

Use '**equal'** or '**equivalent**'

a) Set A and Set D

b) Sets A and C

c) Sets B and F

d) Sets E and C

e) Sets D and E

d) Mr. Mulindwa has goats, cows and sheep on his farm and Mr. Muwonge has sheep, cows and pigs on

his farm. Write the sets of the two farms and state either they are equal of equivalent.

REFERENCES

MK MTC Pupil's book 6 page1

MK MTC Teachers' book 6 page 1

Functional Primary Maths Pupil's book 6 page1-2

LESSON :

TOPIC : SET CONCEPTS

SUBTOPIC : UNEQUAL SETS

CONTENT:

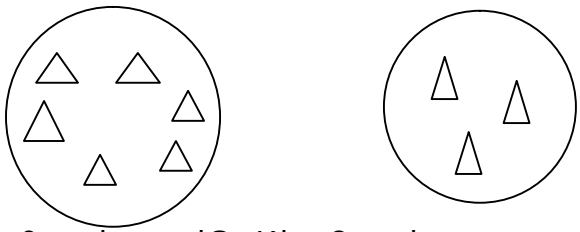
Unequal sets are the sets with different members or different number of members.

N.B: Unequal means not equal.

The symbol for Unequal sets is ≠

Examples:

1. M K



Set M has 6 members and Set K has 3 members.

Therefore Sets M has 6 members and K are Unequal sets

M = K

2. Set T = {4, 5, 6, 7} and Set R = {a, p, q, k}

   Set T is a set of 4 numbers and Set R is a set of 4 letters.

   Sets T and R are unequal sets because their members are different though they have the same number of elements.

   T = R

ACTIVITY:

Given the sets below, write equal or unequal.

1. Set P = {0, 2, 4, 6, 8} and Set Q = {8, 2, 4, 6}

   Sets P and Q are _____ sets

2. Set B = {man, woman, boy}

   Set C = {man, woman, girl}

   Sets B and C are _____ sets.

3. Set D is a set of all the months of the year that start with letter J

   Set E = {January, June, July}

   Sets E and D are _____ sets

4. Given that sets F = {  } G={ ◯ □ △ }

   Sets F and G are _____ sets

REFERENCES

LESSON :

TOPIC : SET CONCEPTS

SUBTOPIC : INTERSECTION AND UNION SETS

CONTENT :

Intersection set

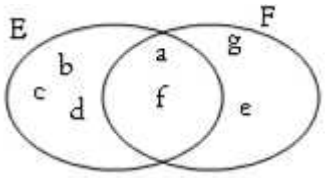
This is a set of common members of given sets.

Union set:

A set of all members in the given sets altogether.

Examples:

Given the venn diagram below,



1. Find E∩F

   E ∩ F = {a, f}

b) Find n(E∩F) = 2 members

   E ∩ F = {a, f}

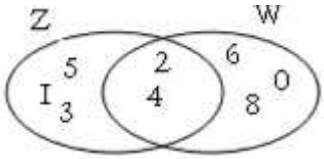
   Hence n(E∩F) = 2 members

c) What is E ∪ F?

   E∪F= {a, f, b, c, d, g, e}

2. Given that Set Z ={1, 2, 3, 4, 5} and W={0, 2, 4, 6, 8}.

a) Represent the sets on a Venn diagram.



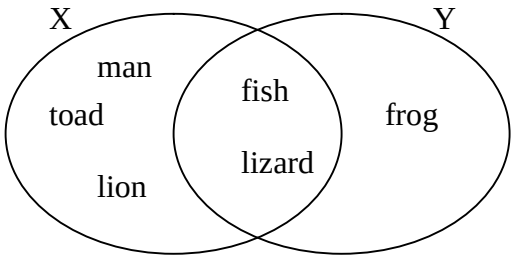
2. Find n(Z∪W)

   Z ∪ W = {0, 1, 2, 3, 4, 5, 6, 8}

   n(Z ∪ W) = 8 members

ACTIVITY:

a) Use the Venn diagram to answer the questions.



a) Find $X \cap Y$.

b) Find $n(X \cap Y)$.

c) Find $Y \cup X$.

d) What is $n(X \cup Y)$?

2. Given that Set K is a set of all factors of 12 and Set L is a set of all factors of 30.

i. Find $K \cap L$.

ii. Find the union set of K and L.

iii. How many elements are in $L \cup K$?

iv. Find $L \cup K$

REFERENCES

A New MK Maths Teachers' Book 6 Pg. 1-2

MK Maths Pupils' Book 6 Page 3-4

LESSON :

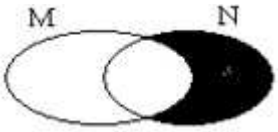
TOPIC : SET CONCEPT

SUB TOPIC : DIFFERENCE OF SETS

CONTENT :

Examples:

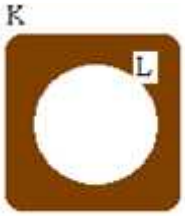
i. Shade N - M on the Venn diagram below.



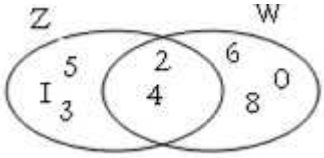
NB N – M refers to the region for M only.

It also means: $N - (M \cap N)$

ii. Shade K- L in the sets.



3. Given the Venn diagram below:-



1. Find W – Z

   W – Z = {0, 6, 8}

   b. Find n(X - W)

   Z – W = {1, 3, 5}

   n(Z - W) = 3 members.

4. Given that Set R is a set of all vowel letters in the word "chair" and Set K is a set of all vowel letters in the word "education".

1. Find K – R
2. Find n(R - K)
3. Set R = {a, i}
4. Set K = {a, e, i, o, u}

   a) K - R = {e, o, u}

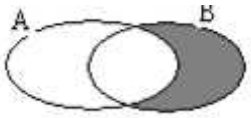
   b) n(R - K)

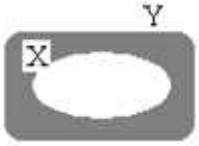
   R - K = { }

   n(R - K) = 0

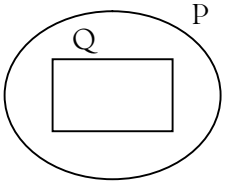
ACTIVITY:

1. Describe the shaded regions





2. Shade P - Q

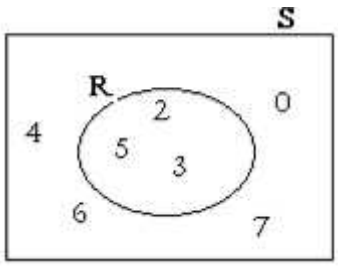


3. Set B = {a, h, k, r, s} Set H = {b, h, t, r, v}.

   i. Find i) H – B

   ii. n(B - H)

4. Study the diagram and answer the questions



i. List the members of set R

ii. Find n(S - R)

5. Set T is a set of all multiples of 4 less than 19. Set M is a set of all factors of 24.

a) Find T - M

b) Find n(M - T)

REFERENCES:

MK Maths Pupil's book 6 page 11-12

MK Maths Teachers' book 6 page 8-9

LESSON :

TOPIC : SET CONCEPTS

SUBTOPIC : COMPLEMENT OF SETS

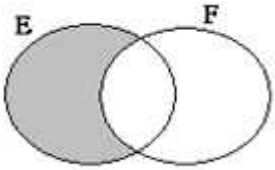
CONTENT :

Complement of a set refers to the region or members with in the union of the given sets but do not belong to that given set.

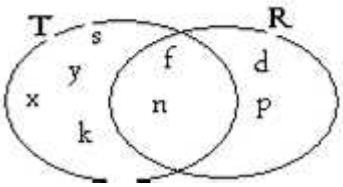
We use the apostrophe sign to write the complement of a set e.g. the complement of a set B is written as B'.

Example.

1. Shade F' in the sets.



2. Given the sets below, find R'



$R^1 = \{k, s, x, y\}$

3. Set Z = {p, q, r, s, t} Set Y = {r, s, t, u, v}

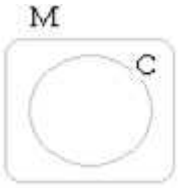
   Find n(Z)'

   Z' = {u, v}

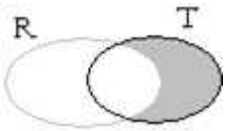
   n(Z') = 2 members.

ACTIVITY:

1. Shade the M – K on the Venn diagram below



2. Describe the shaded region in terms of complement



3. Set W is a set of all composite numbers less than 10 and set X is a set of all even numbers less than 16. Find n(X')

REFERENCES

MK Maths Pupil's book 6 page 9-10

MK Maths Teachers' book 6 page 5-7

Functional Primary Maths Pupil's book 6 page 4-5

LESSON :

TOPIC : SET CONCEPTS

SUBTOPIC : UINVERSAL AND SUBSETS

CONTENT :

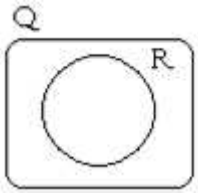
Universal set

This is the mother set or the main/ bigger set. For example, if set Q is a set of all children in VictoriousPrimary School and set R is a set of all children in P.6 class of Victorious, then, set Q is a universal set

Note; Set R is just part of Set Q.

The symbol for universal set is £

The sets Q and R can be represented as



Subset:

A subset is the smaller set which can be obtained from any given set. For example set R above is a subset of set Q since it is just part of Q. The symbol $\subset$ is used to imply 'is a subset of'

The sets above can be written as; $R \subset Q$

Proper subsets

Proper subsets are subsets with the exception of the main set itself.

Number of proper subsets is got by using $(2^n)- 1$

Consider

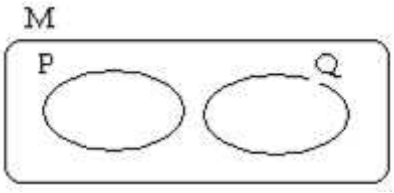
Given that,

Set M is a set of all farmers in MasikuVillage.

Set P is a set of farmers who grow food crops.

Set Q is a set of farmers who rear animals.

Represent the sets on a venn diagram



N.B: - All farmers (M) is the universal set.

All farmers who grow food crops (P) is a subset of M, thus $P \subset M$

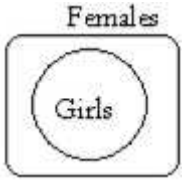
All farmers who rear animals (Q) is subset of M, thus $Q \subset M$

Farmers who rear animals and grow food crops is a subset of M, thus $(P \cup Q) \subset M$

Farmers who grow other crops is a subset of M, thus $(PUQ)' \subset M$

ACTIVITY:

1. Write the relationship between the sets in the Venn diagram below



2. Draw a Venn diagram to show that all animals (A) are Living things (L).

3. It is true that Kampala (K) is found in Uganda (U) which is in Africa (A).

   Represent this statement on a venn diagram.

REFERENCES

MK Maths Teachers' book 6 page 5-6

MK Maths Pupil's book 6 page 3-14

Functional Primary Maths Pupil's book 6 page 8-9

LESSON :

TOPIC : SET CONCEPTS

SUBTOPIC : LISTING AND FINDING NUMBER OF SUBSETS

CONTENT :

Subsets are smaller sets obtained from a given set.

Listing subsets:

Example

1. Set B = {2, 4, 6}. List all the subsets in set B.

   {}, {2}, {4}, {6}, {2,4}, {2,6}, {4,6}, {2,4,6}.

   Note:

   The empty set is also a subset of any given set. The set itself is also a subset of itself.

Finding Number of Subsets

First listing the subsets then count them and finally state the number of subsets formed Using the formula; thus,

Number of Subsets = 2^n

Where n stands fro number of elements in that given set.

Examples

1. Set P = {a, b, c, d}. Find the number of subsets in set P

   n(P) = 4 members

   No. of subsets = 2^n

   $= 2^4$

   = 2 X 2 X 2 X 2

   = 16 Subsets.

   P has 16 subsets.

2. Given that n(K) = 6. Find the number of subset in set K.

   n(K) = 6

   No. of subsets = 2^n

   $= 2^6$

   = 2 X 2 X 2 X 2 X 2 X 2

   = 64 Subsets.

K has 64 subsets.

ACTIVITY:

1. List all the subsets in each of the given sets
   a) Set B = {2,3,4}
   b) Set M = {a, b, c, d}
2. Find the number of subsets in each set by first listing them.
   a) Set Z = {p, q, r}
   b) Set R = {6}
3. Using the formula, calculate the number of subsets the sets below.
   c) Set W = {0, 3, 6}
   d) Set T = { }

e) Set X is a set of 3 blue cows on Mr. Muwonge's farm. Calculate the number of subsets in set X.

REFERENCES

MK Maths Pupil's book 6 page 5-7

MK Maths Teachers' book 6 page 3-5

Functional Primary Maths Pupil's book 6 page 8-9

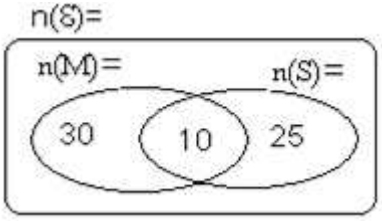
LESSON :

TOPIC : SET CONCEPTS

SUBTOPIC : APPLICATION OF VENN DIAGRAMS

CONTENT :

The Venn diagram below shows how all P.6 children prefer two clubs i.eMaths club and Science club.



a) How many pupils prefer Maths club?

Maths club = n(M) only + n(M∩ N)

= 30 + 10

= 40 pupils.

b) How many pupils prefer both clubs?

10 pupils prefer both clubs

c) How many pupils prefer only one club?

n(M) only + n(S) only

= 30 + 25

= 55 pupils

d) How many pupils are in P. 6 class?

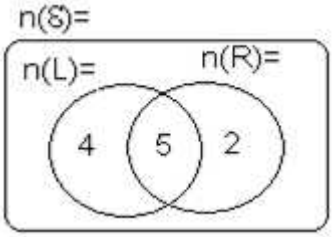
$n(\ ) = n(M) \text{ only} + n(M \cap N) + n(S) \text{ only}$

$30 + 10 + 25$

$= 65$ pupils

ACTIVITY:

The venn diagram below shows how a school football team some use left leg (L), others use the right leg(R) and few use both legs



a) How many members are in the school team?

b) Find the number of players who use left leg.

c) How many players use only one leg?

d) How many players use either left or right leg?

e) How many players use at least on leg?

REFERENCES

MK Maths Pupil's book 6 page 29-30

MK Maths Teachers' book 6 page 10

Functional Primary Maths Pupil's book 6 page 10-12

LESSON: 10

TOPIC: SET CONCEPTS

SUBTOPIC: APPLICATION OF SETS

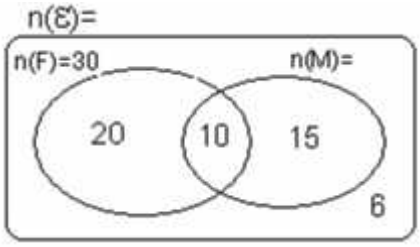
CONTENT:

Representing information on a Venn diagram

1. In a p.6 class, 30 pupils prefer fish (F), 15 prefer meat (M) only, 10 prefer both fish and meat and 6 don't like any of the two.

a) Draw a venn diagram to show the information.

$n(F)=30$ $n(M)\text{only} = 15$ $n(F \cap M)= 10$ $n(F \cup M)^1=6$, $n(\ )=$



b) How many pupils prefer fish only?

$n(F)only = n(F) - n(F \cap M)$

$= 30 - 10$

$= 20$ pupils

c) What is the population of this class?

$n(\ ) = n(F) + n(F \cap M) + n(M)only + n(F \cup M)^1$

$(30 - 10) + 15 + 10 + 6$

$= 20 + 25 + 6$

$= 51$ pupils

d) Find the probability of picking at random a member likes fish only

$n(F) = 30 \quad n(\ ) = 51$

$P(Fish) = \frac{n(F)}{n(\mathcal{E})}$

$= \frac{30}{51}$

ACTIVITY:

1. In a family, 12 members use English (E), 8 use Luganda (L), 4 use both English and Luganda and 3 use neither of the two languages.

   a) Draw a venn diagram to represent the information

   b) B) How many members use only one language?

   c) If each member in this family was given sh. 10,000 for weekend, how much money was given to this family?

   d) What is the probability of getting a member who uses English only?

REFERENCES

MK Maths Pupil's book 6 page 22-24

MK Maths Teachers' book 6 page 11-12

LESSON : 3 PERIODS

TOPIC : SET CONCEPTS

SUBTOPIC : APPLICATION OF SETS

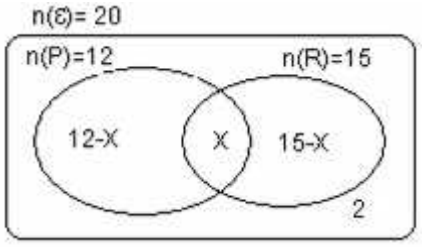
CONTENT :

a) In a school of 20 teachers, 12 teachers prefer posho (P), 15 prefer rice (R), some prefer both posho and rice and 2 prefer neither of the two kinds of food.

1. Represent the information on a venn diagram

   Let $n(P \cap R)$ be X

   $n(P)=12$ $n(R)=15$ $n(P \cap R)=X$ $n(P \cup R)^1=2$, $n(\ )=20$

2. Find 

the number of teachers who prefer both posho and rice.

   Note; for both, it is represented by X

   $X + 12 - X + 15 - X + 2 = 20$

   $X - X - X + 12 + 15 + 2 = 20$

   $^-X + 29 = 20$

   $^-X + 29 - 29 = 20 - 29$

   $^-X = ^-9$

   $X = 9$

   <u>Therefore 9 teachers prefer both posho and rice.</u>

3. Find the number of teachers who prefer only on type of food.

   $(12 - X) + (15 - X)$

   $(12 - 9) + (15 - 9)$

   $3 + 6$

   <u>= 9 teachers</u>

ACTIVITY:

In a class of 40, 25 pupils prefer Maths (M), 20 prefer English (E), p prefer both Maths and English and 5 prefer neither Maths nor English.

a) Represent the information on a venn diagram

b) Find the number of pupils who like both Maths and English

c) How many pupils prefer only one subject?

d) What is the probability of picki8ng a pupil at random who prefers Maths only to be the class monitor?

REFERENCES

MK Maths Pupil's book 6 page 23-25

MK Maths Teachers' book 6 page 13-14

LESSON :

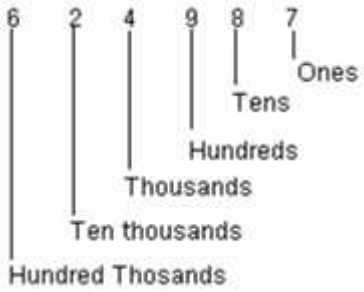
TOPIC : WHOLE NUMBERS

SUBTOPIC : PLACE VALUES AND VALUES

CONTENT :

Examples :

2 Find the place value of each digit in 6 2 4 9 8 7



3 Find the value of each digit in 8 6 4 2 7.

T Th	Th	H	T	O
8	6	4	2	7

Value of a digit = digit x place value

Value of:

7 = 7 x 1 = 7

2 = 2 x 10 = 20

4 = 4 x 100 = 400

6 = 6 x 1000 = 6000

8 = 8 x 10000 = 80000

4 State the place value of each digit in 6 3 4. 7 8

H	T	O		Tth	Hth
6	3	4	.	7	8

Place value of: 6 = Hundreds

3 = Tens

4 = Ones

7 = Tenth

8 = Hundredths

5 Find the value of each digit in 7 2. 9 2 9

T	O	.	Tth	Hth	THth
7	2	.	9	2	9

Value = digit x place value

$7x10 = 70$ $9x\ 1/10 = 9/10 = 0.9$

$2x1 = 2$ $2x\ 1/100 = 2/100 = 0.02$

$9x\ 1/1000 = 9/1000 = 0.009$

ACTIVITY:

a) Write the place value of each digit

1. 3 6 9 8 5 3
2. 1 9 0 0 6 2 4
3. 7 8 3. 3 6
4. 8 9. 8 6 6 3

1. Find the value of each of the digits.
   1. 6 6. 4 2
   2. 1 9 8 6. 7 9 7
   3. 6 1 6. 7 8 9

b) Find the sum of the place value of 7 and the value of 2 in 2 0 0 7 6 3

c) What is the product of the value of 8 and place value of 4 in 8 6 3. 4 7?

REFERENCES

MK Maths Pupil's book 6 page 34-35

MK Maths Teachers' book 6 page 31-33

Functional Primary Maths Pupil's book 6 page 19-25

LESSON :

TOPIC : WHOLE NUMBERS

SUBTOPIC : EXPANDING NUMBERS

CONTENT :

a) Expand 4 9 6 3 in place value form

TH	H	T	O
4	9	6	3

= 4 X 1000 + 9 X 100 + 6 X 10 + 3 X 1

b) Expand 6 8. 6 0 4 in place value form

T	O	T	H	TH
6	8.	6	0	4

= (6 X 10) + (8 X 1) + (6 X 0.1) + (0 X 0.01) + (4 X 0.001)

= (6 X 10 + (8 X1) + (6 X 0.1) + (4 X 0.001)

OR

= (6 X 10) + (8 X 1) + (6 X $^1/_{10}$) + (4 X $^1/_{1000}$)

c) Expand 6 8. 6 0 4 in value form.

T	O	Tth	Hth	THth
6	8.	6	0	4

= (6 X 10) + (8 X 1) + (6 X $^1/_{10}$) + (4 X $^1/_{1000}$)

= (6 X 10) + (8 X 1) + (6 X 0.1) + (0 X 0.01) + (4 X 0.001)

= (6 X 10) + (8 X1) + (6 X 0.1) + (4 X 0.001)

= 60 + 8 + 0.6 + 0.00 + 0.004

d) Expand 8 5. 7 6 4 in power form

Note: In expanding using powers/exponents, the whole numbers take positive powers while the decimal places tale powers. These exponents/powers are of ten.

ACTIVITY:

a) Expand the following using powers of ten.

a) 6 8 8 4 9

b) 2. 6 6 5

c) 1 9 6 3. 3 0 4

b) Expand the following in place value form

1. 1 7 1 7

2. 634.578

3. 49.857

c) Expand the following in value form

1. 54321

2. 78.902

REFERENCES

MK Maths Pupil's book 6 page 34-35

MK Maths Teachers' book 6 page 31-33

Functional Primary Maths Pupil's book 6 page 19-25

LESSON :

TOPIC : WHOLE NUMBERS

SUBTOPIC : WRITING EXPANDED NUMBER IN SINGLE NUMBER

CONTENT :

1. What number has been expanded below?

60000 + 20 + 500 + 3

60000

500

20

\+ 3

60523

2. Find the number that has been expanded

(7 X 1000) + (6 X 0.1) + (5 X 10)

= 7000 + 0.6 + 50

7000.0

50.0

\+ 0.6

7050.6

3. Namuli expanded a certain number and got ,

$(6 \times 10^4) + (5 \times 10^0) + (3 \times 10^1) + (7 \times 10^3)$

What number did she expand?

ACTIVITY:

Find the numbers which have been expanded below

a) 6000 + 20 + 7

b) (7 X 1000) + (8 X 10) + (9 X 100) + (7 X 1)

REFERENCES

MK Maths Pupil's book 6 page 36-37

MK Maths Teachers' book 6 page 36-37

Functional Primary Maths Pupil's book 6 page 22-24

LESSON :

TOPIC : WHOLE NUMBERS

SUBTOPIC : WRITING NUMBERS IN WORDS

CONTENT :

1. Write 6 2 4 9 1 4 in words

Thousands			Units		
H	T	O	H	T	O
6	2	4	9	1	4

624,914 = Six hundred twenty four thousand nine hundred fourteen

2. Write 1 9 0 0 3 0 0 4 7 in words

Millions			Thousands			units		
H	T	O	H	T	O	H	T	O
1	9	0	0	3	0	0	4	7

190,030,047 = One hundred ninety million thirty thousands forty seven

3. Write 2 4. 6 3 in words

T	O		T^{th}	H^{th}
2	4	.	6	3

24.63 = Twenty four and sixty three hundredths

ACTIVITY:

Write the following in words

1. 62,493
2. 171717
3. 9009009
4. 666666666
5. 100100100
6. 14.14
7. 272.009
8. 4634.665
9. 0.0004
10. 6.789

REFERENCES

MK Maths Pupil's book 6 page 39

MK Maths Teachers' book 6 page 39-40

Functional Primary Maths Pupil's book 6 page 24-26

LESSON :

TOPIC : WHOLE NUMBERS

SUBTOPIC : WRITING numbers from words to figures

CONTENT :

a) Write in figures

Seventy four million, six hundred ninety two thousand, five hundred eleven.

Millions			Thousands			Units		
H	T	O	H	T	O	H	T	O
0	7	4	6	9	2	5	1	1

= 74,692,511

b) Seventy nine point four five six.

Seventy nine point four five six = 79.456

c) Our hundred nine and forty six hundredths

One hundred nine = 109

Forty six hundredths = $^{46}/_{100}$ =0.46

109.00

0.46

109.46

ACTIVITY:

1. Write the following in figures

i) Seventeen million, seven thousand, seventeen

ii) To hundred thousand, three hundred sixty four

iii) Sixty six point seventy six million, five hundred forty three thousand, two hundred ten.

iv) Ninety and nine thousandths

2. Write the number represented on the abacus

REFERENCES:

MK Maths Pupil's book 6 page 40-46

MK Maths Teachers' book 6 page 40-45

Functional Primary Maths Pupil's book 6 page 23-25

LESSON :

TOPIC WHOLE NUMBERS

SUBTOPIC : ROUNDING OFF WHOLE AND DECIMAL NUMBERS

CONTENT :

Rounding off means – correcting to the nearest values

Other terms;

- Rounding up
- Rounding down

Examples:

1. Round off 4965 to the nearest,

    1. Tens

        Note: When the next number to the right of the required place is 5 and above, we round up (add one to the digit in the required place) and when it is less than 5, we round (do not add one to the digit) in the required place.

2. Round off 96329 to the nearest hundreds

TTH	TH	H	T	O
9	6	3	2	9

0X100 =0

96300

+ 000

96300

Therefore 96329 96300

3. Round off 728.36 to the nearest whole number
4. Note: Rounding off to the nearest whole number means to the nearest ones.
5. Round off 68.964 to the nearest tenths.

ACTIVITY:

1. Round off 666 to the nearest tens
2. Round off 19634 to the nearest THOUSANDS
3. Round off 45.36 to the nearest tenths
4. WRITE 689.99 to the nearest whole number.
5. WRITE 999.9999 to the nearest thousandths
6. Round off 123121 to the nearest ten thousands.

REFERENCES

MK Maths Pupil's book 6 page 40-46

MK Maths Teachers' book 6 page 40-45

Functional Primary Maths Pupil's book 6 page 23-25

LESSON :

TOPIC : WHOLE NUMBERS

SUBTOPIC : HINDU ARABIC TO ROMAN NUMERALS

CONTENT :

Letters used in Roman Numerals;

I – 1	C - 100
V – 5	D – 500
X – 10	M – 1000
L -50	

a) Write 462 in Roman Numerals

462 = 400 + 60 + 2

= CD + LX + II

= CDLXII

b) Write 1629 in Roman Numerals

1629 = 1000 + 600 + 20 + 9

= M + DCCC + XL + IX

= MDCCCXLIX

Note: We use capital letter form when writing in Roman Numerals

ACTIVITY

1. Write the following in Roman Numerals
    1. 49 d) 2424
    2. 176 e) 964
    3. 3332 f) 1234
2. Lukule was given 3965 books. Express his number in Roman Numerals.
3. How would a Roman girl write 5260?

REFERENCES

MK Maths Pupil's book 6 page 40-46

MK Maths Teachers' book 6 page 40-45

Functional Primary Maths Pupil's book 6 page 23-25

LESSON :

TOPIC : WHOLE NUMBERS

SUBTOPIC : ROMAN NUMERALS TO HINDU ARABIC

CONTENT :

1. Write CDLX in Hindu Arabic Numerals

   Note: When a letter of less value comes before that of a greater value, it means subtraction

   CDLX = CD + LX

   = 400 + 60

   = 460

2. Express CMLXVIII in Hindu Arabic Numerals

   CMLXVIII = CM + LX + VIII

   = 900 + 60 + 8

   = 968

3. Wasswa wrote MMMDXIX on a card. What number is this in Hindu Arabic Numerals?

   MMMDXIX = MMM + D + XIX

   = 3000 + 500 + 19

   = 3519

Activity

Write the following in Hindu Arabic Numerals

1. CCX
2. CCCIX
3. DCCCLXXXVIII
4. CDXCII
5. LIX
6. MMLXXIV
7. CCCIII
8. CDVII
9. XIX
10. CXIX

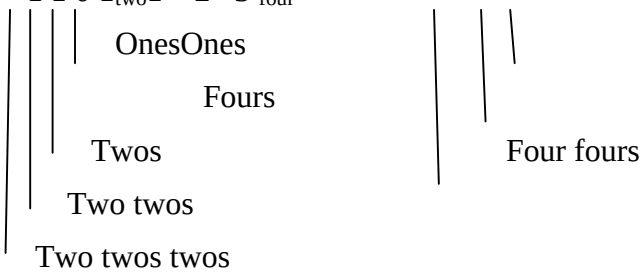
BASES SYSTEM

Place values of digits in non-decimal base

Find the place value of each in the following numbers

a) 1101_{two} b) $1\ 2\ 3_{Four}$

$1\ 1\ 0\ 1_{two}1\quad 2\quad 3_{four}$



Converting from a non-decimal base to a decimal base

Expand using powers of the base then find single values

Covert the following numbers to base ten

a) $1\ 1\ 0\ 1_{two}$

b)

2^3	2^2	2^1	2^0
1	1	0	1

$(1x2^3)+(1x2^2)+(0x21)+(1x2^0)$

$(1x2x2x2)+(1x2x2)+0+(1x1)$

$8+4+0+1$

13_{ten}

ACTIVITY

a)1001_{two}

c) 213_{four}

c)21three

CONVERTING FROM ADECIMAL BASE TO NON-DECIMAL BASE.

Divide or make groups of the asked base from the given number.Combine the reminders from

the currently written one.

Examples.

Express $12t_{en}$ to base two.

Base no	R
2	12

b)Convert $213t_{en}$ to base five.

ACTIVITY

a)Change 24ten to base four.

b)what is the equivalence of 57ten in binary base?

Change 45 to dinary base.

ADDITION NON-DECIMAL BASES.

The greatest value in any base should be less than its base.Incase equality or greater value,divide and regroup.

Examples

a)Add:$241_{five}+203_{five}$

241_{five}

$203five$

444_{five}

ACTIVITY

A)Workout:23seven+124seven

b)What is the sum of 32eight+124eight?

c)Add423six+343six

d)Add 12_{three} to 102_{three}

SUBTRACION ON NON-DECIMAL BASES.

Place values of digits should be followed.in case of borrowinguse the given base.

Example

a)$32_{five}\_12_{five}$

32_{five}

-12_{five}

20_{five}

b)Subtract14_{five} from 41_{five} .

41_{five} | 1+5=6

-14_{five} |

22_{five} |

c)Find largest difference between 812_{nine} and $78_{nine.}$

d)Subtract 123_{six} from 234_{six} and give your answer in base ten.

MULTIPLICATION OF NON-DECIMALBASES.

Normal operation is carried out but incase of greater value than the operating base,divide write the reminder then carry the number of groups.

EXAMPLES 4-4=1ro

a)$21_{four} x 2_{four}$

21_{four}

X2

102_{four}

Find the product of 34_{five} and $4_{five.}$

34_{five}

$X4_{five}$

301_{five}

LESSON :

TOPIC : OPERATION ON NUMBERS

SUB TOPIC : Expressing numbers in power form

Content: Write 32 in power form

2	32
2	16
2	8
2	4
2	2
	1

$32 = 2x2x2x2x2$

$32 = 2^5$

2. Express 625 in powers of 5

5	625
5	125
5	25
5	5

1

625 =5x5x5x5

$625 = 5^4$

ACTIVITY:

1. Express 64 in powers of 4
2. Write 100 in powers of 10
3. What is 81 in powers of 3?
4. Express343 in powers of 7

REFERENCE : MK MTC BK6 PG 84

WRITING EXPRESSIONS IN SHORT

Examples: Write 4x4x4x4x4 in short form

$4x4x4x4x4 = 4^5$

3. Express m^7 in expanded form

   M^7 = mxmxmxmxmxmxm

ACTIVITY:

Express the following in short form

1. Pxpxpxpxpxpxp
2. Nxnxnxnxn
3. 6x6x6x6x6x6x6

b.Express the following in expanded form

1. b^5
2. a^4c^5
3. $2p^3r^5$

Reference : MK MTC BK7 PG 51

VALUES OF POWERS OF NUMBERS

Examples:

1. Find the value of 2^4

   2^4 =(2x2)x(2x2)

   2^4= 4x4

   2^4= 16

2. Find the value of x^3 if x= 3

$X^3 = x\ x\ x\ x\ x$
$= (3x3)x3$ = 27
$= 9\ x3$

Activity

a) Find the value of the following

1. 2^3 2. 2^7 3. 10^3

b) Find the value of m^2 if m=5

c) Find the value of x^3 if x=3

d) Find the value of $6y^2$ if y=5

Reference

MK mathematics book 6 page 85

Addition and subtraction of numbers with powers

Examples

1. Find the value of $4^3 + 3^2$

$4^3 + 3^2$
$=(4x4x4)+(3x3)$
$=64 + 9$
$=73$

2. Workout the value of $2^3 + 3^3 + 5^0$

$2^3 + 3^3 + 5^0$
$=(2x2x2) + (3x3x3) + 1$
$=8 + 27 + 1$
$=36$

Activity

Workout the value of the following

1) $2^4 + 5^2$
2) $3^3 + 4^2$
3) $3^3 - 2^3$

Reference MK mathematics book 6 page 85.

LAWS OF INDICES IN MULTIPLICATION

Examples

1.Simplify : $2^3 \times 2^2$

$= (2x2x2)x(2x2)$

$= 8 \times 4$

$=32$

2	32
2	16
2	8
2	4
2	2
	1

$2x2x2x2x2$

$2^5 = 2^3 \times 2^2$

$2^5 = 2^{(3+2)}$

$2^5 = 2^5$

Therefore, when multiplying numbers/ terms of the same bases, we keep a common base and add the indices.

ACTIVITY

Work out the following

1. $2^4 \times 2^3$
2. $3^2 \times 3^0 \times 3^1$
3. $C^4 \times C^3 \times C$

REFERENCE: Mk mathematics book 7 page 51

Laws of indices in division

Examples:

$4^4 \div 4^2$

$= (4x4x4x4) \div (4x4)$

$= (16 \times 16) \div 16$

$= 256 \div 16$

$= 16$

4	16
4	4
	1

$=4x4$

$= 4^2$

$4^2 = 4^4 \div 4^2$

$4^2 = 4^{(4-2)}$

$4^2 = 4^2$

Therefore, when dividing terms / numbers of the same bases, we keep a common base and subtract the exponents.

ACTIVITY:

Simplify the following

1. $2^5 \div 2^3$
2. $3^6 \div 3^5$
3. $M^7 \div m^5$

Reference; Mk mtc bk 7 page 53.

THE ONE INDEX

Examples

$3^4 \div 3^3$

Expansion law

$\frac{3x3x3x3}{3x3x3} = 3^{(4-3)}$

$3 = 3^1$

Therefore, any num ber / term to index one is that very number / term.

THE ZERO INDEX

Examples;

$5^3 \div 5^3$

Expansion law

$\frac{5x5x5}{5x5x5} = 5^{(3-3)}$

$\frac{1x1x1}{1x1x1} = 5^0$

$1 = 5^0$

THE NEGATIVE INDEX

Examples:

$2^3 \div 2^4$

Expansion = law

$\frac{2x2x2}{2x2x2x2} = 2^{(3-4)}$

$\frac{1x1x1}{1x1x1x2} = 2^{-1}$

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

Therefore, a negative index gives a fractional value with one as a remainder.

MORE ABOUT LAWS OF INDICES.

Examples:

Simplify: $\frac{2^3 \times 2^2}{2^4}$

Method A

$= \frac{(2X2X2)X(2X2)}{2X2X2X2}$

$= \frac{1X1X1X1X2}{1X1X1X1}$

$=2$

Method B

$= \frac{2^{(3+2)}}{2^4}$

$= \frac{2^5}{2^4}$

$=2^5 \div 2^4$

$=2^{(5-4)}$

$=2^1$

$=2$

Reference: Mk mtc bk 7 pg 55

SUBTOPIC : ADDITION OF NUMBERS

CONTENT :

a) Add: 469046 + 63942

469046

+63942

532988

b) There are four million sixty thousand people in Eastern Uganda, six million forty thousand six hundred in Western Uganda and three million fifty thousand in Northern part. Find the total population of the three regions.

Eastern = 4060000

Northern = +3050000

Total =7 1 1 0 0 0 0

The total population in the regions is 7,110,000 people.

ACTIVITY

1. Add the following numbers
    1. 96114 + 3224
    2. 630004 + 99963
    3. 17171717 + 222222
    4. 10000 + 100000 + 1000
2. There are 46920 female and 32690 male in Kamuli District. Find the population of the district.
3. Uganda's population is approximately 33 million and that of South Africa is 66.5million. Find the approximate total population

Reference

MK Maths Pupil's book 6 page 40-46

MK Maths Teachers' book 6 page 40-45

Functional Primary Maths Pupil's book 6 page 23-25

LESSON :

TOPIC : OPERATION ON NUMBERS

SUBTOPIC : subtraction of large numbers

CONTENT :

a) Subtract 85604 – 64503

- Arrange the numbers vertically according to the place values of the given digits the subtract.

b) Subtract 2896475 from 8331843

Interpretation of the '*from*' operation, thus
8331843 – 2896475
- arrange vertically and subtract

c) There are 49625 text books in Victorius Library. 16240 are maths books and the rest are other subjects. How many books are for other subjects?

Total no. of books 4 9 6 2 5

Numbeerosmaths - 1 6 2 4 0

Other subjects 33385

ACTIVITY:

1. Subtract the following
    1. 40000 – 3000
    2. 562003 – 49999
    3. 634963241 – 100100100
2. Subtract 99 from 10000000
3. What is the difference between 3694 and 76300?
4. How far is 50,000 metres away from 19500m?
5. In a country of 36 million people, 2,563,200 are adults and the rest are child. Find the number of children in this country.

MULTIPLICATION NUMBERS

1. Multiply 242 X 12

242
X 12

484

+2420

2 904

2. A school bus carries 68 passengers when full. If it makes 42 trips, how many passengers will be carried altogether?

In one trip, it carries 68 passengers

In 48 trips it carries (42 x 68) passengers

42

x68

2520

+ 336

2856

The bus carries 2856 passengers in the 42 trips

ACTIVITY:

Multiply the following

1. 66 X 424
2. 117 X 24
3. 6636 X 36
4. 9103 X 133
5. 817 X 1313
6. 312 X 495

The average number of children in 136 schools in Mukono district is 1250. Find the total population in all the schools.

Find the product of 396 and 3298.

Reference

MK Maths Pupil's book 6 page 40-46.

MK Maths Teachers' book 6 page 40-45.

Functional Primary Maths Pupil's book 6 page 23-25.

LESSON :

TOPIC : OPERATION ON NUMBERS

SUBTOPIC : DIVISION OF NUMBERS

CONTENT :

1. Divide 7620 by 20

```
          0381
        ________
20 )7620
         - 0
          76
        - 60
          162
        -160
          . .20
           -20
```

2. Divide 76050 ÷ 234

Children. be encouraged to divide using multiples if the divisor (see P.5 notes)

ACTIVITY:

Divide the following numbers:

2 1256 ÷ 13

3 25610 ÷ 132

4 Divide 5600 by 250

REFERENCES:

Functional Primary Maths Pupil's book 6 page 47-48

MK Maths Teachers' book 6 page 72-73

LESSON :

TOPIC : PATTERNS AND SEQUENCES

SUBTOPIC : DIVISIBILITY TESTS

CONTENT :

Divisibility test by 2

A number is divisible by 2 when it ends with, 0, 2, 4, 6, 8

e.g. 66, 200, 7204, 98, 24, 62

Divisibility test by 3

A number is divisible by 3 when the sum of its digits is 3 or 6 or 9.

e.g. i) 291

291 2+9+1 = 12

12 – 1+2 = 3

Therefore 291 is divisible by 3

ii) State whether 12631 is divisible by 3 or not.

12631 – 1+2+6+3+1

= 13

= 1+3

= 4

Therefore 12631 is divisible by 3

Divisibility test by 5

A number is divisible by 5 when it ends with either 0 or 5. E.g. 500, 25, 2795, 35090, 33000

Divisibility test by 4

A number is divisible by 4 when its last two digits are multiple of 4 i.e 00, 04, 08, 12, 16, 20, 24, 28, 32……..

Examples:

a) Check whether 224 is divisible by 4

224 – The last two digits make 24 and 24 is divisible by 4

Therefore 224 is divisible by 4

ACTIVITY:

a) Which of the following numbers is divisible by 2

a) 37 b) 9990 c) 179

b) Test for divisibility by 3 and state whether the number is divisible by 3 or not

1. 63 c) 29631
2. 178

c) Is 694 divisible by 4 or not?

d) Check whether 3595 is divisible by 5

e) Complete the table by using YES or NO

Number	**By 2**	**By 3**	**By 4**	**By 5**
3334	YES			
69250		NO		YES
1304	NO			
630001				
8896			YES	

REFERENCES:

E.A.E.P Primary Maths book 6 page 16-17

MK Maths Teachers' book 6 page 76-77

MK Maths Pupil's book 6 page 65

LESSON :

TOPIC : PATTERNS AND SEQUENCES

SUBTOPIC : GEOMETRICAL SEQUENCES

CONTENT :

a) Square numbers

A square number is obtained or got by multiplying a number by itself.

e.g. $1^2 = 1X1 = 1$

$2^2 = 2X2 = 4$

$3^2 = 3X3 = 9$

$4^2 = 4X4 = 16$

$5^2 = 5X5 = 25$

$6^2 = 6X6 = 36$

$7^2 = 7X7 = 49$

$8^2 = 8X8 = 64$

Therefore 1, 4, 9, 16, 25, 36, 49, 64,…… are square numbers

b) Triangular numbers

Triangular numbers are obtained by adding consecutive numbers. They can be represented as the pattern below.

1 = 1

1+2 = 3

1+2+3 = 6

1+2+3+4 = 10

The sequence;

1, 3, 6, 10, 15, 21, 28, 36……

c) Cubic numbers.

These are numbers got by multiplying the same number three times

$1^3 = 1X1X1 = 1$

$2^3 = 2X2X2 = 8$

$3^3 = 3X3X3 = 27$

$4^3 = 4X4X4 = 64$

$5^3 = 5X5X5 = 125$

ACTIVITY

1. Write down all the square numbers between 10 and 65
2. Find the sum of the second and fifth triangular numbers
3. Find the first four cubic numbers
4. Find the value of 6^3
5. What is the square of 99?

REFERENCES:

E.A.E.P Primary Maths book 6 page 18-19

Functional Primary Maths Pupil's book 6 page 62-64

MK Maths Teachers' book 6 page 76-78

MK Maths Pupil's book 6 page 65-69

LESSON :

TOPIC : PATTERNS AND SEQUENCES

SUBTOPIC : ARITHMETIC PROGRESSION

CONTENT :

1. Even numbers

Numbers which are divisible by 2 with no remainder e.g. 0, 2, 4, 6, 8, 10, 12, 14, 16……

2. Odd numbers

Numbers you divide by two and get a remainder as 1 e.g. 1, 3, 5, 7, 9, 11, 13, 15……..

Note; the pattern froa even and odd number is by adding 2

3. Counting numbers

These are numbers from 1 up to no end.

They are also called National numbers e.g. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13,……

4. Prime numbers

A prime number is a number with only two factors, which is 1 and itself, e.g 2, 3, 5, 7, 11, 13, 17, 19, 23, 29……..

5. Composite numbers

A composite number is a number with more than two factors. E.g. 4, 6, 8, 9, 10, 12, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30……..

ACTIVITY

1. Find the sum of the first four even numbers
2. What is the product of the second and sixth odd number?
3. Divide the tenth counting number by the first prime number.
4. What is the difference between the sixth composite number and the third prime number?
5. Write all prime numbers between 20 and 36

REFERENCE

MK Maths Teachers' book 6 page 79-81

MK Maths Pupil's book 6 page 73-80

CONSECUTIVE NUMBERS

i) The sum of three consecutive counting numbers is 15. Find the numbers.

Let the first number be Y

The pattern of counting numbers is by adding

1st be y; 2nd = y+1 3rd = y+2

Sum = 15

y+y+1+y+2 = 15

y+y+y+1+2 = 15

3y+3 = 15

3y+3-3 = 15 – 3

y = 4

y+I = 4+I = 5

y+2 = 4+2 = 6

The numbers are 4, 5, 6

$^{3y}/_{3} = {}^{12}/_{3}$

$y = 4$

ii) Find the sum of four consecutive even numbers when the smallest number is 6

6, 8, 10, 12

$= 6+8+10+12 = 36$

ACTIVITY

1. Musa wrote three consecutive counting numbers on the chalkboard. If the second number was 9, find the sum of the numbers he wrote.
2. The median of three consecutive odd numbers is 21. Find the numbers
3. Find the four consecutive counting numbers if their sum is 86
4. The total of three consecutive even numbers is 60. Find their range

REFERENCE

MK Maths Teachers' book 6 page 80-81

MK Maths Pupil's book 6 page 76-78

PRIME FACTORISATION

- Prime factorization can be done in two methods.

1. Using ladder method
2. Using factor tree method

- Prime factorization can also be in power form or subscript form.

Examples

a) Prime factorize 36 and give your answer in a power form.

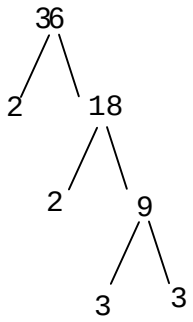
F_{36}

2	36
2	18
2	9
3	3
3	1

$= (2 \times 2) \times (3 \times 3)$

$= 2^2 \times 3^2$

F_{36}



$= (2 \times 2) \times (3 \times 3)$

$= 2^2 \times 3^2$

b) Prime factorize 48 and give your answer in subscript form

$F_{48} = 2 \times 2 \times 2 \times 2 \times 3$

$= \{2_1, 2_2, 2_3, 2_4, 3_1\}$

NOTE: Subscript form is also called set form.

ACTIVITY

a) Prime factorize the following and give the answer in a power form

1. 12 d) 100
2. 24 e) 125
3. 72 f) 18

b) Prime factorize and give the answer in subscript

1. 90 b) 32 c) 15 d) 120

REFERENCE

Functional Primary Maths Pupil's book 6 page 65-67

MK Maths Teachers' book 6 page 82-84

MK Maths Pupil's book 6 page 83-84

FINDING PRIME FACTORISED NUMBERS

1. What number has been expanded below?

   2 X 2 X 3 X 3 X 3

   = (2 X 2) X (3 X 3) X 3

   = 4 X 9 X 3

   = 36 X 3

   = 108

2. Find the prime factorized number to get $2^3 \times 3^2$

   $2^3 \times 3^2 = (2 \times 2 \times 2) \times (3 \times 3)$

   = 8 x 9

   = 72

3. Find the number that has been expanded below;

   $\{2_1, 2_2, 2_3, 3_1, 5_1\}$

   $= 2_1 \text{ X } 2_2 \text{ X } 2_3 \times 3_1 \times 5_1$

   = (2 x 2 x 2) x (3 x 5)

   = 8 x 15

   = 120

ACTIVITY

Find the numbers which have been prime factorized;

1. 2 X 3 X 5
2. 2 X 3 X 3 X 5
3. 2^3 X 3^1
4. 5^2 X 7^1
6. $\{2_1, 3_1, 5_1\}$
7. $\{7_1, 11_1\}$
8. 7^1 X 11^1 X 13^1

REFERENCES

MK Maths Teachers' book 6 page 82-84

Functional Primary Maths Pupil's book 6 page 67-68

PRIME FACTORS ON VENN DIAGRAMS

1. Prime factorize 18 and 12 and represent their prime factors on a venn diagram

Note: On a venn diagram, we put subscripts. So we prime factorize in subscript from.

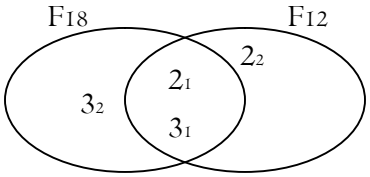
2	18
3	9
3	3
	1

$18 = 2_1\ 2_2\ 3_1\ 3_2$

2	12
2	6
3	3

$12 = 2_1\ 2_2\ 2_3\ 3_1$

Common prime factors $\{2_1, 3_1\}$



Find the G.CF of F_{18} and F_{12}

G.C.F = Product of factors in F18 $\cap$ F12 .

$= 2_1 \times 3_1$

$= 2 \times 3$

$= 6$

2. Work out the L.C.M of F_{18} and F_{12}

L.CM = Product of factors F18 $\cup$ F12 .

$L.C.M = 2_1 \times 3_1 \times 2_2 \times 3_2$

$L.CM = 2 \times 3 \times 2 \times 3$

$= 6 \times 6$

L.C.M = 36.

ACTIVITY

a) a) Prime factorize 40 and 15 and represent their prime factors on a venn diagram

b) Find their L.C.M

c) Calculate their G.C.F

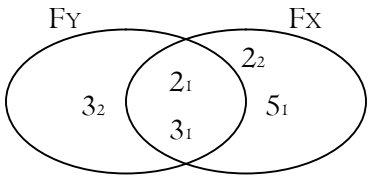
REFERENCES

Functional Primary Maths Pupil's book 6 page 68-69

MK Maths Pupil's book 6 page 82-85

INTERPRETING VENN DIAGRAMS

1. The venn diagram below shows the prime factors of Y and X



a) Find the value of Y

$Y = 2_1 \times 3_1 \times 3_2$

$Y = 2 \times 3 \times 3$

$Y = 6 \times 3$

$Y = 18.$

b) Find the value of X

$X = 2_1 \times 2_2 \times 3_1 \times 5_1$

$X = 2 \times 2 \times 3 \times 5$

$X = 12 \times 5$

$X = 60.$

c) Find the L.C.M of F_Y and F_X

L.C.M = Product of factors $F_Y \cup F_X$.

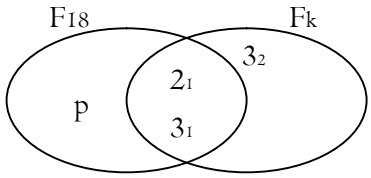
$L.C.M = 2_1 \times 2_2 \times 5_1 \times 3_1 \times 3_2$

$= (2 \times 2 \times 5) \times (3 \times 3)$

$= 20 \times 9$

<u>L.C.M = 180</u>

2. a) Find the value of P and K in the figure



$p \times 2_1 \times 3 = 12$	$K = 2_1 \times 3_1 \times 3_2$
$p \times 2 \times 3 = 12$	$K = 2 \times 3 \times 3$
$\frac{6P}{6} = \frac{12}{6}$	$K = 6 \times 3$
$P = 2.$	$K = 18$

b) Find the G.C.F of F_{12} and F_K

G.C.F = Product of Intersection

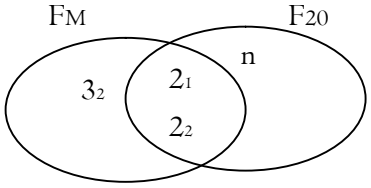
$= 2_1 \times 3_1$

$= 2 \times 3$

G.C.F = 6

ACTIVITY

i) Given the venn diagram below



1. Find the value of

1. m ii) n

2. Work out the L.C.M of F_m and F_{20}

3. Calculate the G.C.F of F_m and F_{20}

REFERENCES

Functional Primary Maths Pupil's book 6 page 68-70

NOTE ; Guide learners through solving problems involving application of LCM and GCF.

SQUARES AND SQUARE ROOTS OF WHOLE NUMBERS

Squares:

1. Find the square of 5

   $5^2 = 5 \times 5 = 25$

2. What is the square of 16

   $16^2 = 16 \times 16 = 256$

Square Roots:

a) Find the square root of 9

$\sqrt[2]{9}$ =

3	9
3	3
	1

$= 3 \times 3$

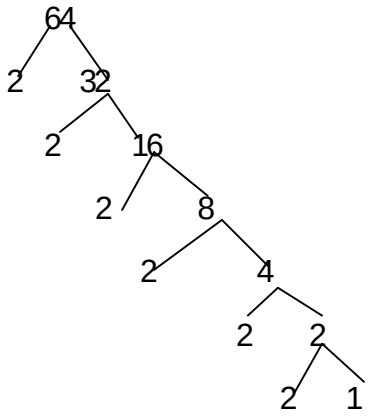
$= 3^2$

$\sqrt[2]{9} = \sqrt[2]{3^2} = 3$

Therefore $\sqrt{9} = 3$.

b) Work out the square root of 64

$\sqrt{64}$ =



$= 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$= 2^6$

So, $\sqrt[2]{64} = \sqrt[2]{2^6} = 2^3 = 2 \times 2 \times 2 = 8$

Therefore, $\sqrt{64} = 8$.

Square roots can also be got by using odd numbers

c) Find the square root of 6

16 – 1 = 15

15 – 3 = 12

12 – 5 = 7

7 – 7 = 0

Therefore, √16 = 4.

Note: We subtract odd numbers in their order sequence until we get 0 and count the number of odd numbers used.

ACTIVITY:

a) Find the square root of each

1. 4 d) 121
2. 25 e) 196
3. 100 f) 255

b) Find the square of each

1. 6 c) 100
2. 10 d) 25

REFERENCE

MK Maths Teachers' book 6 page 88

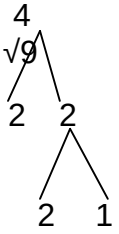
MK Maths Pupil's book 6 page 95-97

Functional Primary Maths Pupil's book 6 page 71-74

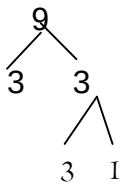
SQUARE ROOTS OF FRACTIONS

a) Find the square root of $^4/_9$

$\sqrt{\frac{4}{9}} = \frac{\sqrt{4}}{\sqrt{9}} = \frac{4}{\sqrt{9}}$ $= {}^2\sqrt{2^2} = 2.$



$\sqrt{9} = 9$



$= 3 \times 3 = 3^2 = {}^2\sqrt{3^2} = 3$

Hence $\sqrt{(4/9)} = 2/3$

b) Work out the square root of $2^7/_9$

$\sqrt{2^7/_9} = \sqrt{25/9} = \sqrt{9}$

25 | 5 5 | 1

$= {}^2\sqrt{5 \times 5} = {}^2\sqrt{5^2} = \mathbf{5.}$

39 | 33 | 1

$= {}^2\sqrt{3 \times 3} = {}^2\sqrt{3^2} = \mathbf{3.}$

SO $\sqrt{25/9} = 5/3$

$= \sqrt{2^7/_9} = \mathbf{1^2/_3.}$

ACTIVITY

a) Work out the square roots of the following

1. $100/1000$ c) $9/16$ e) $6^1/_4$ g) $1^7/_9$
2. $1/4$ d) $1^{19}/_{81}$ f) $81/100$

REFERENCE

MK Maths Teachers' book 6 page 88-89

MK Maths Pupil's book 6 page 98-100

MK Maths Pupil's book 7 page 56-57

Understanding Maths Pupil's book 7 page 43-44

SQUARES ROOTS OF DECIMALS

1. Find the square root of 0.49

$$\frac{\sqrt[2]{0.49}}{\sqrt{100}} = \frac{\sqrt[2]{49}}{\sqrt[2]{100}} = \frac{7}{10} = 0.7$$

$\sqrt{\frac{49}{100}}$

7	49
7	7
	1

$= \sqrt[2]{7 \times 7} = \sqrt[2]{7^2} = 7$

$\sqrt{100}$

2	100
2	50
5	25
5	5
	1

$= \sqrt[2]{2 \times 2 \times 5 \times 5} = \sqrt[2]{2^2 \times 5^5} = 2 \times 5 = 10$

Note: Square roots of decimals, we change the decimal into a common fraction first and after the square root of each part, we take it back to decimal form.

2. Work out the square root of 0.0081

$$\sqrt{0.0081} = \frac{\sqrt{81}}{\sqrt{10000}} = \frac{9}{100} = 0.09$$

ACTIVITY

Find the square root of each decimal;

1. 0.36
2. 0.81
3. 1.44
4. 1.96
5) 2.25
6) 1.21
7) 0.0004
8) 0.0064

REFERENCE

Understanding Maths Pupil's book 7 page 45-46

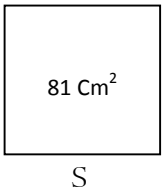
MK Maths Pupil's book 7 page

MK Maths Pupil's book 6 page 101

MK Maths Teachers' book 6 page 89

MORE ON SQUARES ROOTS

1. The area of a square is 81 cm^2. Find the length of each side of the square.



Area $= S^2$

$81\ Cm^2 = S^2$

$\sqrt[2]{81\ Cm^2} = \sqrt[2]{S^2}$

S = 9 cm

3	81
3	27
3	9
3	3

$\sqrt{81} = \sqrt{(3 \times 3 \times 3 \times 3)}$

$= \sqrt[2]{3^4}$

$= 3 \times 3$

= 9

Therefore, Side = 9 Cm

2. Solve, $K^2 = 0.0004$

$\sqrt{K^2} = \sqrt{0.0004}$

$\sqrt{K^2} = \sqrt{\frac{4}{10000}}$

$K = \frac{2}{100}$

$K = 0.02$

Solve $2Y^2 = 50$

$2y^2 = 50$

Dividing each term by the coefficient

$\frac{2y^2}{2} = \frac{50}{2}$

$Y^2 = 25$

Taking the square root on both sides

$\sqrt{y^2} = \sqrt{25}$

$y = 5$

5	25
2	1

$\sqrt{25} = 5 \times 5$

$= \sqrt[2]{5^2}$

$= 5$

ACTIVITY

Mulindwa's square garden covers an area of 100 m^2. Calculate the length of each side of the garden.

The base area of a cube is 16 cm^2. Find its height.

A farmer used a barbed wire to fence his square garden that covers an area of 196 m^2. Find the length of the barbed wire used.

Solve $P^2 = 1$

Solve $900 = m^2$

Find the value of $3r^2 = 12$

REFERENCES

INTEGERS

Number line

A straight line drawn indicating the order of number directed by signs i.e positive and negative.

Infinite

Horizontal number line

Values increases from left to right or bottom to top

Additive inverses

Sum of any integer with its additive inverse is 0

Examples

Find the additive inverses of:

a) $+4$

Let the additive inverse be y

$Y + {}^{+}4 = 0$

$\mathbf{Y} + {}^{+}4 - + {}^{+}4 = 0 - {}^{+}4$

b) $^{-}3$
c) $^{+}6$
d) $^{+}17Y = {}^{-}4$

Order and comparison of integers

Values of integers from right to left

Arrange the following integers in

a) Ascending order
b) Descending order

$^{-}1, {}^{+}2, 0, {}^{+}4, {}^{-}3$

Ascending order

$^{-}3, {}^{-}1, 0, {}^{+}2, {}^{+}4$

Descending order

$^{+}4, {}^{+}2, 0, {}^{-}1, {}^{-}3$

Use > or < to compare the and complete the statements

a) $^{-}4$ _____ $+4$

b) $^{-}16$ _____ $^{-}4$
c) $^{+}1$ _____ $^{+}6$

d) $^{-}34$ _____ $^{-}18$

Interpreting arrows on a number line

Any arrows that points to the positive direction is called a positive arrow while that which points to the negative integers is a negative arrows

Negative arrow

Positive arrow

Indicate the values of the arrows on the number line below

a= $^{+}3$

b= $^{-}3$

Task in the MK book Pg. 349

Addition of integers on a number line

Examples

a) Add: $^{+}5 + {}^{+}1$

$^{+}5 + {}^{+}1 = {}^{+}6$

b) $^{+}7 + {}^{-}6$

$^{+}7 + {}^{-}6 = {}^{+}1$

Task on pg. 351 book 6

Addition of integers without using a number line

Examples

Add: $^{+}5 + {}^{+}1$

$^{+}5 + {}^{+}1 = {}^{+}5 + ({}^{+}1)$

$= {}^{+}5+1$

$= {}^{+}6$

Workout: $^{+}7 + {}^{-}6$

$^{+}7 + {}^{-}6 = {}^{+}7 + ({}^{-}6)$

=+7-6

$^{+}7+ {}^{-}6 = {}^{+}1$

Note: Product of same signs is a positive (+)

Product of different signs is a negative (-)

Task on page 352 MK book 6

Subtraction of integers on a number line

Face represents positive direction while back is negative

Forward = positive (+)

Backward = negative (-)

Example

$^{+}2 - {}^{+}4$

Draw a number line to show $^{+}5 - {}^{-}6 = {}^{+}11$

Task on pg. 353 MK book 6

Subtraction on integers without using a number line

Examples

Simplify; $^{+}2 - {}^{+}4$

$^{+}2- {}^{+}4 = {}^{+}2- ({}^{+}4)$

$^{+}2 -{}^{+}4 = {}^{+}2 -4$

+ves ++

-ves - - - -

$^{+}2 - {}^{+}4 = {}^{-}2$

Work out; $^{+}5 - {}^{-}6$

+- -6 = +5 – (-6)

$= {}^{+}5+ 6$

+ves ++++++++

-ves$^{+}5 - {}^{-}6 = {}^{+}11$

What is the difference between -4 and +2 respectively?

$^{-}4 - {}^{+}2 = {}^{-}4-({}^{+}2)$

$= {}^{-}4-2$

$^{-}4 - {}^{+}2 = -6$

More tasks on pg. 358 MK book 6

MULTIPLICATION OF INTEGERS

The result or product of a positive integer and the other positive or same integer directions is positive.

The result of a positive and a negative or different integer directives is negative.

The first value should be a positive number when using a number line.

a) $^{+}2 \times {}^{+}4$

Multiply;

b) $^{-}2 \times {}^{+}4$

$^{-}2 \times {}^{+}4 = 2 \times {}^{-}4$

$= {}^{-}8$

Activities on page 359 MK BOOKS.

MULTIPLICATION OF INTEGERS WITHOUT USING A NUMBER LINE

Examples;

a) Multipl: $^{+}2 \times {}^{+}4$

$^{+}2 \times {}^{+}4 = (- \times +)\ (2 \times 4)$

$^{+}2 \times {}^{+}4 = {}^{+}8$

b) Workout: $^{+}2 \times {}^{+}16$

$^{-}2 \times {}^{+}16 = (- \times +)\ (2 \times 16)$

$^{-}2 \times +16 = -\ (32)$

$^{-}2 \times {}^{+}16 = {}^{-}32$

c) What is the product of 4 and $^{-}3$?

Product $= 4 \times {}^{-}3$

$4 \times {}^{-}3 = (+ \times -)\ (4 \times 3)$

Product $= {}^{-}12$

Task on page 360 MK BOOK 6

APPLICATION OF INTEGERS

Examples

1. The temperature of a place was 23^0C and dropped by 4^0C. What is the temperature of that place?

New temp.

$23^0C - 4^0C = 19^0C$

2. Male arrived at the station 15mins before the normal departure time for a train to Kasese,if the train was 35mins late ,how long did he wait?

   Usual dep. time is 0
   15mins before hence $^-15$
   35mins late hence -35
   $(^+35 - ^-15)$
   $^+35 - (^-15) = (^+35\ ^+15)$mins
   = 50mins

3. Cylane had a deb of sh.15,000 from Marvin.He received salary shs.100,000. Find Cylaine's financial stanmd after paying the debt.

Tasks on page MK BOOK 6

2. +2 x -6 = -12

3. -2 x -6 = +12

+ve÷ -ve = -ve

+ve÷ +ve = +ve

-ve ÷ -ve = +ve

-ve ÷ +ve = -ve

Examples:

1. +16 ÷ +2 = +8
2. +16 ÷ -2 = -8
3. -16 ÷ +2 = -8
4. -16 ÷ -2 = +8

(1) $^+12 \div ^+3 = ^+4$ (2) $^-30 \div ^-5 = ^+6$ (3) $^+100 \div ^-4 = ^-25$ (4) $-6 \div ^+2 = ^-3$

EVALUATION ACTIVITY:

A New MK Primary Mathematics 2000 Bk 7 exercise 19:7Pg 361 (New Edition)

New MK Bk 7 Pg 320 – 321 (exercise 16:9 & 16:10)

LESSON 23:

SUB TOPIC: APPLICAION OF INTEGERS

CONTENT:

BC, Loss, Time before, debts, below sea level are negative.

AD, Profit, Time after, cash, above sea level are positive.

Example 1:

A Scientist was born in 30BC and died immediately after his birthday in 47AD. How old was he when he died?

Date of birth

The man lived from 30 = -30

The Scientist lived from +47AD = +47

He lived from (+47 - -30)

= 47 + 30

=77 years

EVALUATION ACTIVITY:

A New MK Primary Mathematics 2000 Bk 7 Pg 362 - 363 (New Edition)

New MK bk 7 Pg 322 – 324 exercise 16:11.

THEME: DATA HANDLING

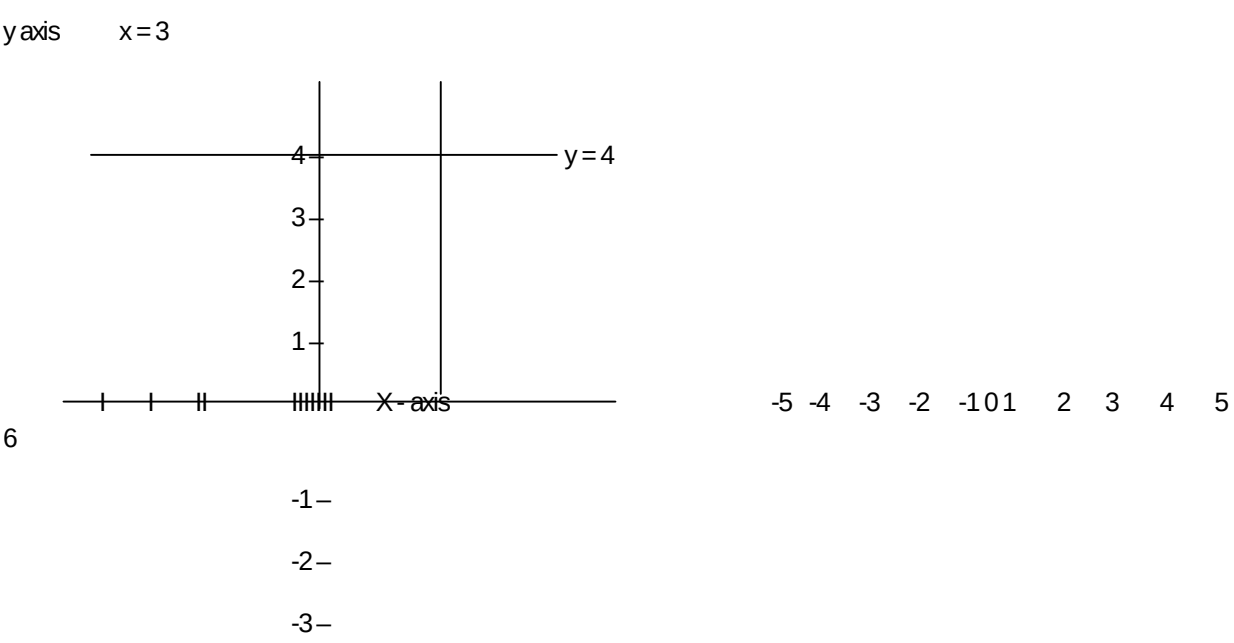
TOPIC: CO-ORDINATES

LESSON:23

SUB TOPIC: Drawing co-ordinate graphs

CONTENT: -Identifying the x axis and y axis

-Drawing and naming lines on co –ordinate graphs



Examples

(1) Draw the line X = 3 and name the corresponding points of y.

(3, 1), (3, 2), (3, 3), (3,0), (3, -1) etc

(2) Draw the line y = 4 and name the corresponding points of x.

(0, 4), (1, 4), (2, 4), (-1, 4)

(3) Name the co-ordinates of the intersection of the lines

(3,4)

EVALUATION ACTIVITY:

MK Primary Mathematics Bk 7 page 98

LESSON: 24

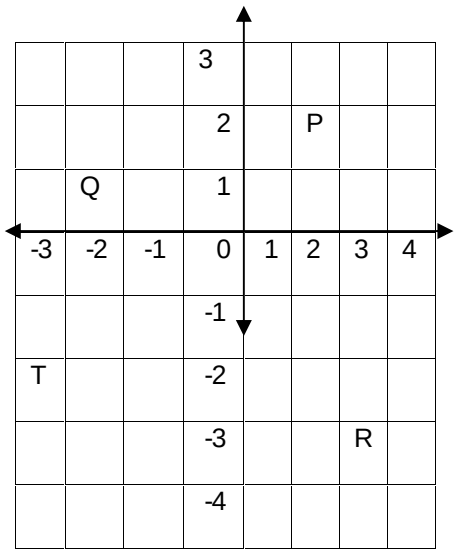
SUB TOPIC: Drawing co-ordinate graphs

CONTENT: -Identifying co-ordinates of given points

-Plotting co-ordinates of given point

Examples

(1)Study the graph below and find the co-ordinate for P, Q, R and T.



(2) Plot the following co-ordinates on the grid above.

A(2,3), B(3, -3), C(2, -3), (-3, 4), (0, 1)

LESSON: 25

SUB TOPIC: Drawing co-ordinate graphs

CONTENT –Plotting points and joining them to form polygons

-Finding areas and perimeters of polygons formed.

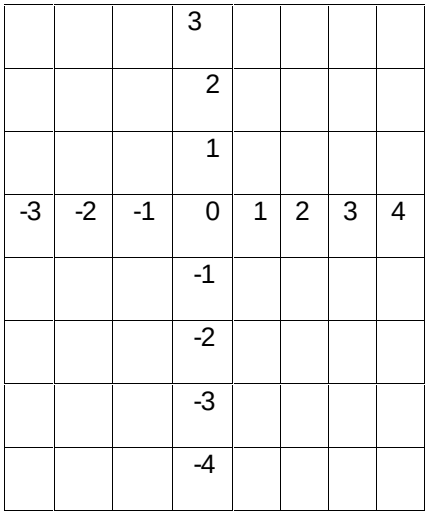
Example

Plot the following points on the grid below.

(1). A(-1, 2), B(-4,-3), C(3, -3),

-Join A to B, B to C and C to A. Name the polygon formed.

- Find the area of the polygon formed.



(2) W(-2, -2), X(-2, 3), Y(1, 3), Z(4, -2)

LESSON 28:

TOPIC: FINITE SYSTEM

SUB TOPIC: OPERATION ON FINITE SYSTEM .

CONTENT: -Counting numbers in finite system

Examples

Finite 4 …{0,1,2,3,0,1,2,3,…}

Finite 5 ….{0,1,2,3,4,…}

Finite 6….{0,2,3,4,5,0,1 …}

Activity.

(1).Name the finite and complete the sequence;

(a) 0,1,2,_,4,0,__,_

(b)0,1,2,3,4,5,6,0,_,_

(2)Write the next equivalent number in the sequence below.

(a)5(finite 6)={5,11,17,23, _ , _)

(b)3 (finite7)={3,10,17,24, _ , _)

LESSON: 29

SUB TOPIC: OPERATION ON FINITES.

CONTENT:-Addition of finites without dial.

-Addition of finite using dial

Example:

(i) Add 6 + 7 = ___ (finite 9)
6 + 7

13 ÷ 9 = 1 rem 4

∴ 6 + 7 = 4 (finite 9)

(ii)
8 + 6 + 3 = ____ (finite 13) NB Use the dial method

(8 + 6) + 3

14 + 3

17 ÷ 13 = 1 rem 4

∴ 8 + 6 + 3 = 4 (finite 13)

(iii) 3 + 4 + 5 = x (finite 7)

EVALUATION ACTIVITY:

A New MK Old Edition Pupils Bk 6 Pg 47 exercise 6:2

LESSON 30:

SUB TOPIC: OPERATION ON FINITE.

CONTENT: **Subtraction of finite system with and without dial**

Examples:

(i) 1 – 3 = ___(finite 4)
(1 + 4) – 3

5 – 3

= 2

$\therefore$ 1 – 3 = 2 (finite 4)

(ii) $2^2 - 5 =$ ___ (finite 7)
$(2 \times 2) - 5 =$ ___ (finite 7)

4 – 5 = ___ (finite 7)

4 + 7 – 5

11 – 5

= 6

$\therefore$ $2^2 - 5 = 6$ (finite 7)

(iii) 2 – 6 – 4 – 8 = ___ (finite 9) NB: Use dial method.

EVALUATION ACTIVITY:

A New MK Pupils Bk 7 Pg 48 exercise 4:1

LESSON 31:

SUB TOPIC: OPERATION ON FINITES.

CONTENT: **Multiplication of finite system with and without the dial**

examples:

(i) 5 x 7 = ____ (finite 9) Use the dial method
= 5 x7

= 35 ÷ 9

3 rem 8

$\therefore$ 5 x 7 = 8 (finite 9)

(ii) $2^3 =$ ___(finite 7)
$= 2^3$

= 2 x 2 x 2

= 4 x 2

= 8 ÷7

= 1 rem 1

$\therefore 2^3 = 1$ (finite 7)

(iii) 4 (5 x 2) = ___ (mod 6)

EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7 Pg 50 exercise 4:

LESSON 32:

SUB TOPIC: OPERATION ON FINITES.

CONTENT: **Division in the finite system**

(Review use of dial clock in dividing numbers)

Example:

Divide 2 ÷ 5 = ___ (Mod 7)

2 ÷ 5= ___ (mod 7)

2(mod7) = 2, 9, 16, 23, **30**…

30 ÷ 5 = 6(mod7)

2 ÷ 5 = 6(mod 7)

EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7

Maths Revision Hand Book 5, 6 & 7 Pg 35

Primary Maths Revision & Practice for UgandaPg 19

LESSON 33:

SUB TOPIC: OPERATION ON FINITE.

CONTENT: **Solving equations in finite system.**

Examples:

(i) $x - 4 = 3 \pmod 7$

$x - 4 + 4 = 3 + 4 \pmod 7$

$x + 0 = 7 \pmod 7$

$x = 7 \div 7 \pmod 7$

$x = 1 \text{ rem } 0 \pmod 7$

$x = 0 \pmod 7$

(ii) $m + 4 = 3 \pmod 5$

$m + 4 - 4 = 3 - 4 \pmod 5$

$m + 0 = (3 + 5) - 4 \pmod 5$

$m = 8 - 4 \pmod 5$

$m = 4 \pmod 5$

(iii) $2x - 3 = 3$ (finite 4)

$2x - 3 + 3 = 3 + 3$ (finite 4)

$2x + 0 = 6$ (finite 4)

$\frac{2x}{2} = \frac{6}{2}$ (finite 4)

$x = 3$ (finite 4)

(iv) $2(2x - 1) = 4$ (finite 7)

$2 \times 2x - 1 \times 2 = 4$ (finite) 7)

$4x - 2 = 4$ (finite 7)

$4x - 2 + 2 = 4 + 2$ (fin 7)

$4x = 6$ (finite 7)

$4x = 6 + 7$ (finite 7)

$4x = 13 + 7$ (fin 7)

$\frac{4x}{4} = \frac{20}{4}$ (fin 7

$X = 5$ (finite 7)

EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7 Pg 49 - 50 exercise 4:2, 4:3

LESSON 34:

SUB TOPIC: OPERATION ON FINITE SYSTEM

CONTENT: Application of finite 7

(i) Today is Thursday, what day of the week will it be 82 days from today?
Solution:

Thursday stands for 4

4 + 8 = ___ (finite 7)

86 = ___ (finite 7)

86 ÷ 7 = __ (finite 7)

12 rem 2

2 stands for Tuesday

It will be Tuesday.

(ii) Today is Tuesday what day of the week was it 85 days ago.
Solution:

2 represents Tuesday

2 – 85 = ___ (finite 7)

85 – (finite 7)

85 ÷ 7 = 12 rem 1

85 = 1 (fin 7)

2 – 1 = __ (finite 7)

2 – 1 = 1 (finite 7)

1 stands for Monday

The day was Monday.

EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7 Pg 53 exercise 4:5

LESSON 35:

SUB TOPIC: OPERATION ON FINITE SYSTEMS

CONTENT: Application of finite 12

Digits representing specific months in the year.

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
DIGITS	1	2	3	4	5	6	7	8	9	10	11	0

Example:

(i) It is July now, which month of the year will it be after 2132 months?
Solution:

7 represents July

7 + 2132 = 178 rem 3(finite 12)

3 stands for March.

So the month will be March.

(ii) It is April now, which month of the year was it 346 months ago?
Solution:

4 stands for April

4 – 346 = ___ (finite 12)

346÷ 12 = 28 rem 10 (finite 12)

4 – 10 = (fin 12)

(4 + 12) – 10 + (fin 12)

16 – 10 = 6 (fin 12)

6 stands for June

So the month was June

EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7 Pag 54 – 55 exercise 4:6

LESSON 36:

SUB TOPIC: OPERATION ON FINITE SYSTEMS

CONTENT: Application of finite 12

Example:

(i) It is 7:00 am. What time will it be after nine hours from now?
Solution:

$7 + 9 = \_\_$ (fin 12)

$16 = \_\_$ (fin 12)

$16 \div 12 = 1$ rem 4

It will be 4:00pm

(It will change to p.m if the quotient is an odd number)

(ii) It is 11:00 pm what time will it be nineteen hours from now?
Solution:

$11 + 19 = \_\_$ (fin 12)

$30 = \_\_$ (fin 12)

$30 \div 12 = 2$ rem 6

It will be 6:00pm

(it will remain in pm since the quotient is an even number.)

EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7 Pg 55- 56 exercise 4:7

EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7 Pg 56-57 exercise 4:8

LESSON 37:

SUB TOPIC: OPERATION ON FINITE SYSTEMS

CONTENT: **Application of more than one finite.**

Example:

A Headmaster bought some pens. Teachers grouped them in groups of nines but seven pens were left and if they grouped them in groups of 8's, 4 pens were left. If they grouped them in 3's only 1 pen is left. How many pens were bought by the headmaster?

Solution:

7 (finite 9) = 7, 16, 25, 34, 43, 52, 61…..…

4 (finite 8) = 4, 12, 20, 28, 36, 44, 52, 60….

1 (finite) = 1, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31, 34, 37, 40, 43, 46, 49, 52, 55….

The common number for all is 52 so they were 52 pens.

EVALUATION ACTIVITY:

A New MK Primary Maths Pupils Bk 7 Pg 57 exercise 4:9

END