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:

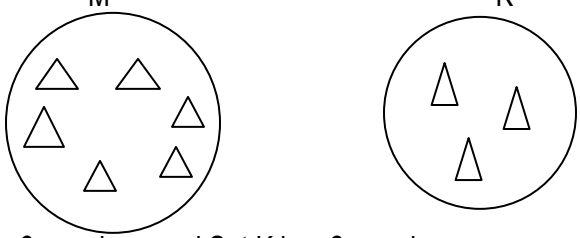
Unequal sets are the sets with different members or different number of members.

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

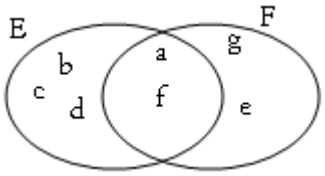
This is a set of common members of given sets.

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}

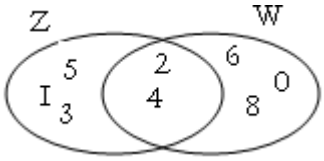
   Hence n(E∩F) = 2 members

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.



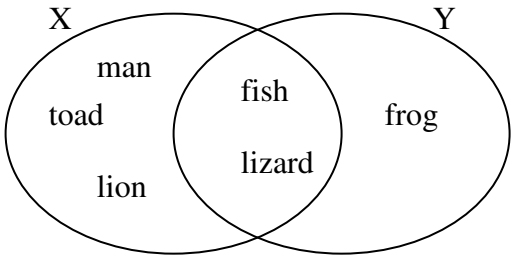
2. Find n(Z∪W)

   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 :

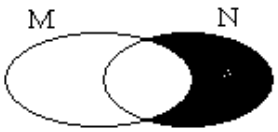
TOPIC : SET CONCEPT

SUB TOPIC : DIFFERENCE OF SETS

CONTENT :

Examples:

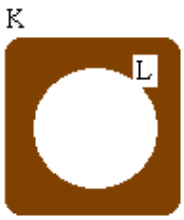
i. Shade N - M on the Venn diagram below.



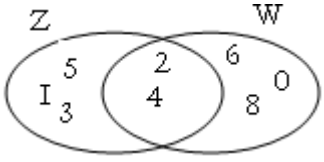
NB N – M refers to the region for M only.

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}

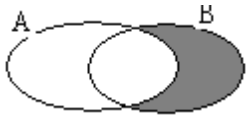
   b) n(R - K)

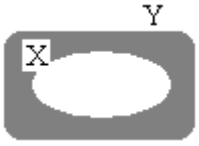
   R - K = { }

   n(R - K) = 0

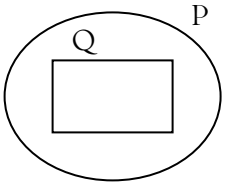
ACTIVITY:

1. Describe the shaded regions





2. Shade P - Q

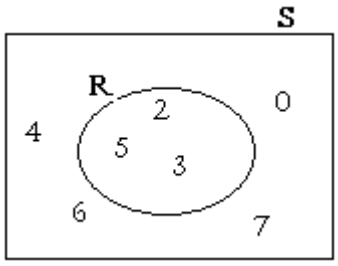


3. Set B = {a, h, k, r, s} Set H = {b, h, t, r, v}.

   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

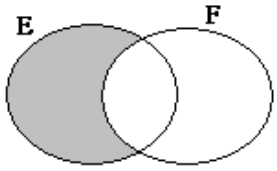
CONTENT :

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.

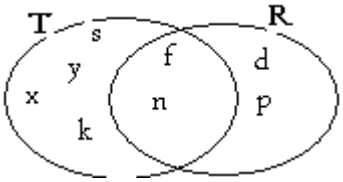
We use the apostrophe sign to write the complement of a set e.g. the complement of a set B is written as B'.

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}

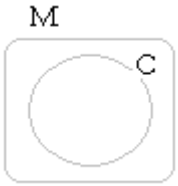
   Find n(Z)'

   Z' = {u, v}

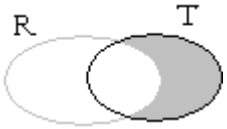
   n(Z') = 2 members.

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 :

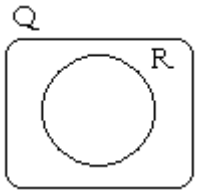
Universal set

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 ε

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

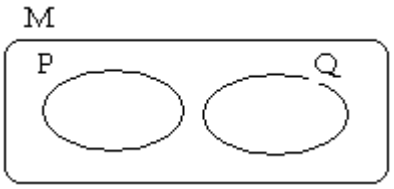
Given that,

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 $P \subset M$

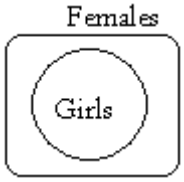
All farmers who rear animals (Q) is subset of M, thus $Q \subset M$

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

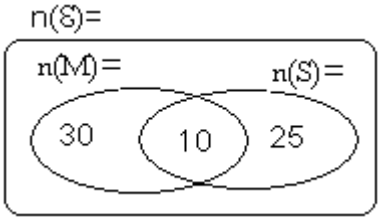
LESSON :

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?

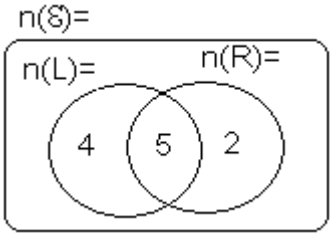
$n(\xi) = n(M)\text{ only} + n(M \cap N) + n(S)\text{ only}$

$30 + 10 + 25$

$= 65$ 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

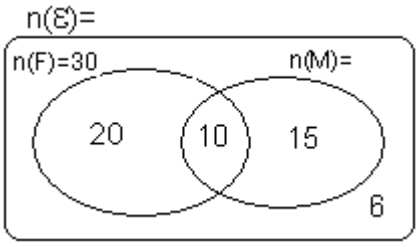
CONTENT:

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.

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



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?

$n(\varepsilon) = n(F) + n(F \cap M) + n(M)only + n(F \cup M)'$

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

$= 20 + 25 + 6$

$= 51$ pupils

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

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

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

$= \frac{30}{51}$

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

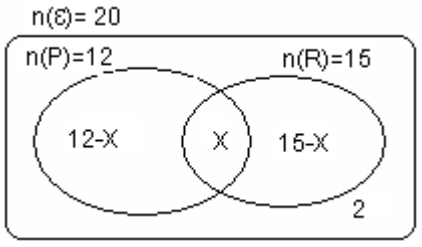
CONTENT :

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

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

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 :

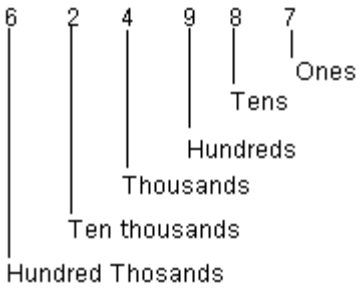
TOPIC : WHOLE NUMBERS

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 $9 \times \frac{1}{10} = \frac{9}{10} = 0.9$

2x1 = 2 $2 \times \frac{1}{100} = \frac{2}{100} = 0.02$

$9 \times \frac{1}{1000} = \frac{9}{1000} = 0.009$

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. 6 3 4. 5 7 8

3. 4 9. 8 5 7

c) Expand the following in value form

1. 5 4 3 2 1

2. 7 8. 9 0 2

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 = <u>Six hundred twenty four thousand nine hundred fourteen</u>

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 = <u>One hundred ninety million thirty thousands forty seven</u>

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

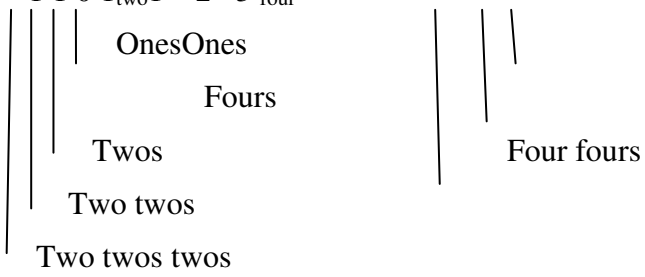
1. CCX
2. CCCIX
3. DCCCLXXXVIII
4. CDXCII
5. LIX
6. MMLXXIV
7. CCCIII
8. CDVII
9. XIX
10. CXIX

BASES SYSTEM

Place values of digits in non-decimal base

Find the place value of each in the following numbers

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



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.

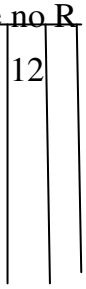
Divide or make groups of the asked base from the given number.Combine the reminders from

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

$\underline{625 = 5^4}$

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

4 6 9 0 4 6

+ 6 3 9 4 2

5 3 2 9 8 8

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 = 4 0 6 0 0 0 0

Northern = +3 0 5 0 0 0 0

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 3 3 3 8 5

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

```
  2 4 2
X  12
-------
4 8 4

+ 2 4 2 0
---------
  2  9 0 4
---------
```

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

```
  4 2
x 6 8
-----
  2 5 2 0
+ 3 3 6
-------
  2 8 5 6
-------
```

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

```
          0 3 8 1
        ----------
20 )7 6 2 0
        - 0
          7 6
        - 6 0
          1 6 2
        - 1 6 0
          . . 2 0
          - 2 0
```

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) <u>Square numbers</u>

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) <u>Triangular numbers</u>

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.

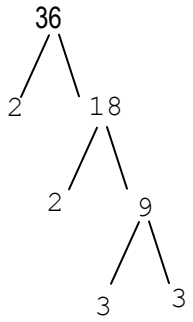
F_{36}

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;

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

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

   = (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.

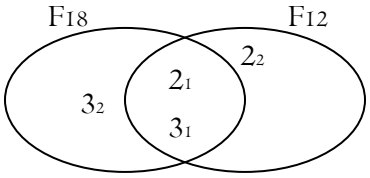
2	18
3	9
3	3
	1

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

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

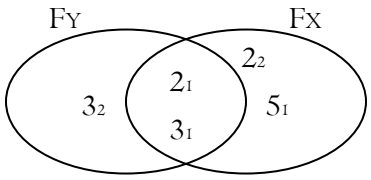
REFERENCES

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

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

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

$X = 12 \times 5$

$X = 60.$

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

L.CM = Product of factors $F_Y \cup F_X$.

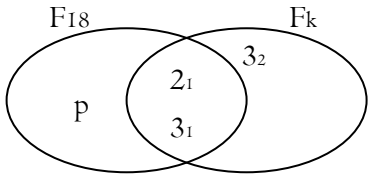
$L.C.M = 2_1 \times 2_2 \times 5_1 \times 3_1 \times 3_2$

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

$= 20 \times 9$

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

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



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

$P = 2.$

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

G.C.F = Product of Intersection

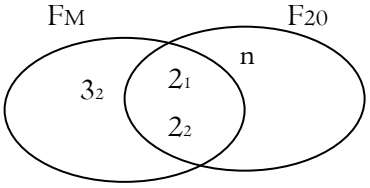
$= 2_1 \times 3_1$

$= 2 \times 3$

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

$= 3 \times 3$

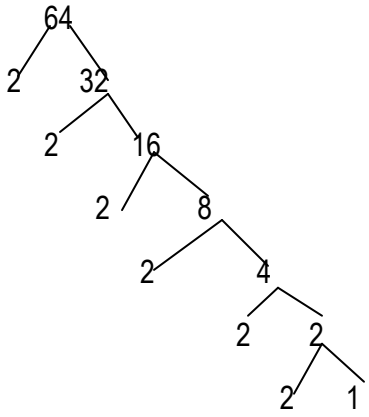
$= 3^2$

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

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, $\sqrt{16} = 4$.

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

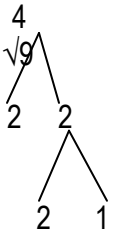
MK Maths Pupil's book 6 page 95-97

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 3

3 1

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

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

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

$\sqrt{2^7/_9} = \sqrt{25}/_9 = \sqrt{25}$ 5 25 | 3 9

$\sqrt{9}$ 5 5 | 3 3

1 | 1

$= {}^2\sqrt{5 \times 5}$ $= {}^2\sqrt{3 \times 3}$

$= {}^2\sqrt{5^2}$ $= {}^2\sqrt{3^2}$

= 5. **= 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

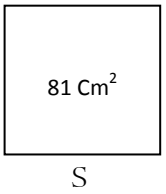
MK Maths Pupil's book 7 page

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, $K^2 = 0.0004$

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

$\sqrt{K^2} = \sqrt{\ ^4/_{10000}}$

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

$K = 0.02$

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

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

$y = 5$

$\sqrt{25} =$

5	25
2	1

$\sqrt{25} = 5x5$

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

$= 5$

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 $+^{+}4 = 0$

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

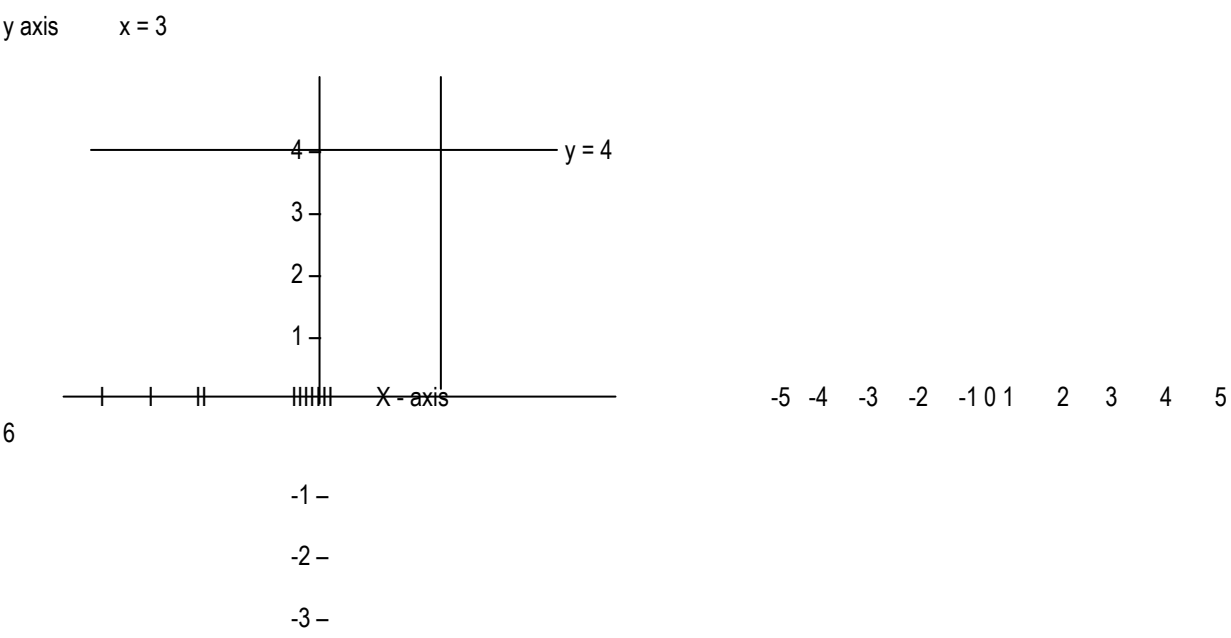
TOPIC: CO-ORDINATES

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

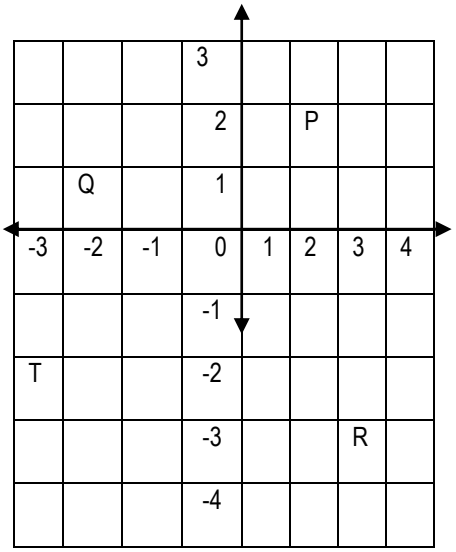
SUB TOPIC: Drawing co-ordinate graphs

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.

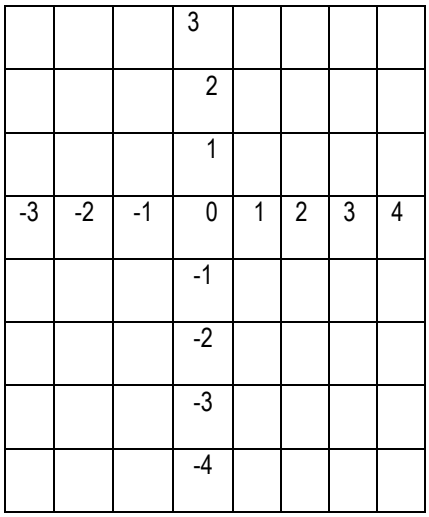
Example

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 x 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 ÷ 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 ÷ 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

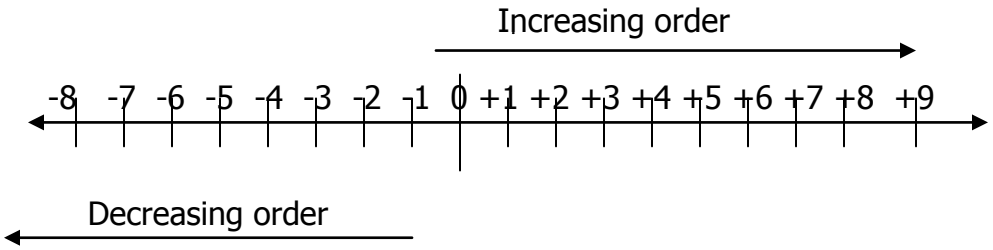
P.6 Maths Lesson Notes

INTEGERS:

Integers are a set of numbers, which include: positive numbers, negative numbers and zero. Positive and Negative numbers are called directed numbers because the sign used indicates which direction to go from zero.

ORDER OF INTEGERS**:**

Any integer to the right of any given integer on the number line is greater than the one to the left of that given integer, and any integer to the left of any given integer is less than that given integer.



Meaning of signs used in integers

Addition means Continue. **Positive means Forward movement**

Subtraction/Minus means Turn back movement. **Negative means Backward**

REVISION EXERCISE 17:

1: Evaluate $8 + {}^{-}3$

2: Work out $10 - {}^{-}2$

3: Simplify: $-\mathbf{9} - -4$

4: Work out $-5 - 8$

5: Simplify: $-12 - -4$

6: Evaluate: $-6 - -11$

7: What is the sum of -3 and -12?

11: Work out: $-18 + {}^{+}20$

12: Add: ${}^{+}2 + {}^{+}5$ using number line

13: Workout; ? + +5 =0

14: Add: $+4 + -6$ using number line

15: Simplify: 7m + ? =0

16: Evaluate: $-15 - -18$

17: Evaluate: $-9 - -4$

8: Simplify $(-5) _ (-7)$

9: Work out $-4 _ (-8)$

10: Simplify: $-2 _ -2$

18: Show on a number line $4 _ -2$

19: Simplify: $(-7) - (-3) - (+2)$

20: Simplify: $(-5) - (-10) + (-6)$

REVISION EXERCISE 18:

1: Simplify: $-4 _ -20$

2: Work out: $-3 \times +5$

3: Simplify: $-18m _ -10m$

4: Add: $-3 + -4$

5: Evaluate: $(-5) _ (-1) _ (-3)$

6: Show $-2 _ -5$ on a number line.

7: Decrease: $-4a$ by $-2a$

8: Show 2×6 on a number line.

9: Work out: $-81 \div 3$

10: Evaluate: $-7 _ -7$

11: Work out: $5 + -2$

12: Calculate: $-18 \div -3$

13: Simplify: $-10 _ +15$

14 Work out $4 _ -3$ on a number line

15: Simplify: $(-5) - (-2) + (-7)$

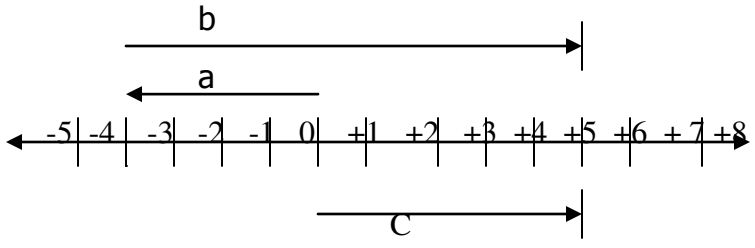
16: Add: $-2.6 + -3.2$

17: Evaluate: $-7 _ -3$

18: Simplify: $-8m - 4m$

19: Evaluate $(11) - (-3) - (+12)$

20: Give a mathematical statement for the figure below.(Hence Find a, b, c)



APPLICATION OF INTEGERS:

Examples:

1: A man was born in 17 BC and died in 35AD immediately after his birthday. How old was he when he died?

Solution: BC = -ve = 35 – −17 AD = +ve = 35 +17 = **52 years**

2: The temperature of ice was -3^0c and that of water was 100^0c calculate the difference in temperature.

Solution: = 100 – −3 = 100+3 = **103^0c**

3: John arrived at the airport 15 minutes before the normal departure time for the plane

If the plane was 35 minutes late, how long did John wait at the airport?

Solution: Before = -ve and late = +ve.

= 35 – −15 = 35+15 **= 50minutes**

4: Mary had a debt of 200,000/= from each of her 4 friends.

How much debt had she in all?

Solution: Debt = -ve 200,000 x4 =800,000/

She had a debt of 800,000//= (-800,000)/=

If she sold her car at 2,000,000/=,how much did she remain with after paying the

Debt?

Solution: 2000,000-800,000

1200,000/= remained

5: A teacher gave a test of 20 questions and a warded 2 marks for each correct answer given and deducted a mark for each answer got wrong.

If a pupil got 18 numbers correct, what mark did the pupil get?

Solution: correct = 18 x2 = 36

Wrong = 2 x -1 = -2

34 marks

b: If a pupil obtained 25 marks, how many numbers did the pupil get correct?

(Ii) How many numbers did the pupil fail?

Solution: Let correct numbers be n then wrong is (20 – m)

Correct	wrong	total mark
n.	(20 – n)	25
2n	-1(20 –n) =	25
2n – 20 + n	= 25	
2n +n –20	= 25	
3n –20 + 20	= 25 +20	correct = **15 numbers**
3n	= 45	
3	3	Wrong = **5 numbers**

REVISION EXERCISE 19:

1: A frog jumped 3 steps 5times before diving into the pond. What distance had it covered before diving into the pond if each step is 1 metre?

2: The temperature on the slopes of a mountain was 20^0c and the temperature at its peak was -15^0c. Find the difference in temperature.

3: A motorist moved 100 metres forward and reversed 120 metres. How far is he from the starting point?

4: A man climbed electric pole 10 steps upwards and slipped 4 steps down wards. How far is he from the ground if each step represents one metre?

5: The temperature of ice dropped by 2^0c and by another 3^0c. Find the final temperature of the ice?

6: A passenger missed the bus by 5 minutes. If the next bus arrived 15 minutes later. How long did the passenger wait at the bus park?

7: On a rainy day the temperature was 3^0c below zero in the morning. In the afternoon the temperature rose by only 8^0c. What was the temperature in the afternoon?

8: The normal body temperature of a human being is 37^0C. Before treatment malaria Patient had a 4^0C increase and after the treatment, the temperature reduced by 2^0C.

Find the body temperature of the patient after treatment.

9: Kato put ice at -15^0C into a kettle and boiled it to 100^0C.He waited till the temperature dropped by 50^0C and drank it

a: What was the temperature difference between ice and boiled water?

B: What was the difference in temperature between ice and the water which Kato drank?

10: Akello can run a race in a time of 5 seconds less than 5 minutes. Achom can run the same race in 2 seconds more than Akello. What is Achom's time for the race?

11: Peter went 20 minutes earlier to the airport to wait for his brother. If the plane arrived 15 minutes late. How long did Peter wait at the airport?

12: An electric pole is 500 cm long .if 85 cm is below the ground. What part of the pole is above the ground?

13: A man walked 10 steps backward and then 15 steps forward ward. What distance was he away from the starting point if each step is equals 50 cm?

14: The temperature of ice is -5^0c and the temperature of boiling water is 100^0c. What is the difference in temperature?

15: The temperature during the day in London was 15^0c,but during the night the temperature dropped by 20^0c.What was the temperature during the night?

16: A football team scored 4points and lost 3, Scored 2 points and lost 1 and lastly scored 6points and lost 3. What was the total score after scoring the six successive games given?

17: Badru moved 6 spaces forward, then 3 spaces backwards and more 2 spaces forward.

a) How many spaces did he move forward?

b) How far is he from the starting point if each step =1metre?

18: A man climbed an electric pole. He started climbing 3 steps upwards and slips One step down wards in that order. Find the number of steps he is from the ground after Slipping 4 steps downwards.

c) What distance was he from the ground if each step 50cm?

19: When marking a test, a teacher a warded 3 marks for every question got correct and subtracted a mark for any wrong answer.

If the test contained 25 questions and a pupil got 22 numbers correct,

a: How many narks did the pupil get?

B: A pupil scored 40 marks, how many numbers did the pupil get correct?

20: A mathematics examination contains 30 questions. 3marks are a warded for every answer got correct but a mark is deducted for every number failed.

d) If a candidate got 25 questions correct, how many marks did the candidate score?

B **:** If a candidate scored 66 marks, how many numbers did that candidate fail?

21: The temperature at the foot of mount Rwenzori was 15^0c. When a climber reached at the top of it, the temperature dropped by 17^0c. What was the temperature at top of the mountain?

ANSWERS

REVISION EXERCISE 17

1: $^{+}5$

2: 12

8

3: -5

4: -13

5: -8

6: $^{+}5$

7: -15

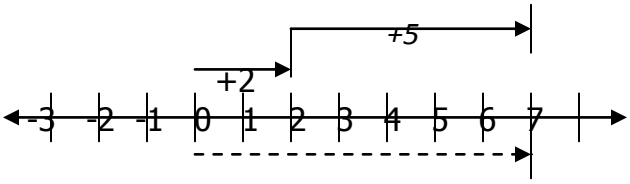
8: $^{+}2$

9: $^{+}4$

10: 0

11: $^{+}2$

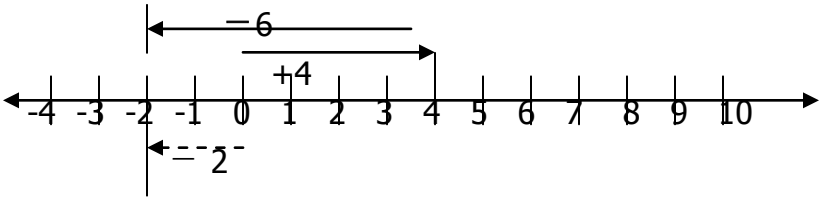
12:



13:` -5

+7

14:

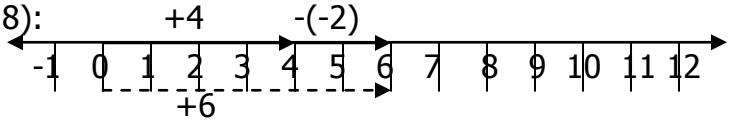


15: $-7m$

16: 3

17: -5

(18):



19: -6

20: -1

(19) -6

20: -1

REVISION EXERCISE 18

1: 16

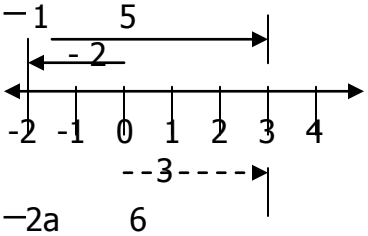
2: -15

3: $-8M$

4: -7

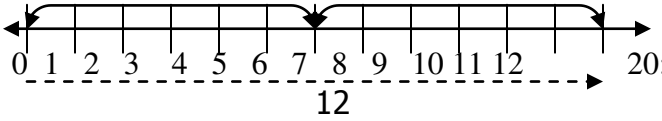
5: -1

6:



7: $-2a$

8:



9: -27

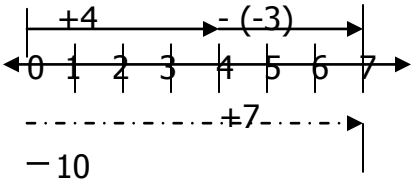
10: 0

11: 3

12: 6

13: -25

14:



15: -10

16: -5.8

17: - 4

18: -12m

19: 2

20: a)= -4 b) = +9 ©= +5

REVISION EXERCISE 19

1:	15 metres	10:	4 minutes 57 sec.	18:	8steps
2:	35^{0}c	11:	35 minutes	b):	400cm
3:	20 metres behind	12:	415 cm	19:	60 marks
4:	6 metres	13:	500 cm	19b):	18 correct

5:	-5^0c	14:	105^0c	20:	70 marks
6:	20 minutes	15:	-5^0c	20b:	6 wrong
7:	5^0c	16:	5 points		
8:	39^0c	17:	8 spaces	21:	-2^0c
9:	115^0c	b):	5 metres		
	e) 65^0c				

ALGEBRA.

REVISION EXERCISE 20:

Work out the following:

1:	Simplify:	p + p + p + p	11:	Simplify:	12y + 8y – 10y
2:	Work out:	4b + 2b + a – b	12:	Work out:	2(p +3k) +p
3:	Solve:	2n + 3 = 9	13:	If r = ⁻3 and k = ⁻ 6 Find r – k	
4:	Work out:	2x +6 +4x + 4	14:	Evaluate:	$2m^2$ when m =3
5:	Simplify:	10m – 3k – 3m +2k	15:	Simplify:	$ab^2 - 5ab^2 + 3ab^2$
6:	Simplify:	14p ⁻ ⁻ 6p	16:	Solve:	15 + x = 20
7:	Work out:	4xy +7ac + 5xy – 3ac.	17:	Subtract 2y – 4 from 4y – 5	
8:	Solve:	3y –3 = 6	18:	Simplify:	2(3m + n) + (2m+ n)
9:	Simplify:	6a – 9b –2 a +12b	19:	Work put:	$2n^2$ = 32
10:	Work out:	$2m^2 + 8m^2$	20;	Simplify:	½ (4w + 6t)

REVISION EXERCISE: 21

1: ⁻ **2(m + n)** **2:** **(3a + b) (-y)** **3:** **4y(2a +b)**

4: **(5 + a+ c) p** **5:** **3z (4y – 5z)** **6:** **4(2a –3b)**

7: ⁻ **p (**⁻ **3p + 7y)** **8:** ⁻ **2 (**⁻ **x – 4)** **9:** ⁻ **(3m +5m**

10 $^{-}$2 ($^{-}$2y – 4) 11: (9x – 4) – (x –2) 12: 6(p + 2) – 2(p+4)

13: 5(q +3) – 3 (q – 1) 14: 4(x –2) – 3(x – 2) 15: (3x+5) –(2x +3)

16: $^{-}$6x($^{-}$1 + 2) 17: 2(a +3b) + 3(a +b) 18: $^{-}$4 (n – 6) + 2(3n –2)

19: (7m –1) +(m –6) 20: 3(t +4) –2(t +5)

MORE ON THE REMOVAL OF BRACKETS.

REVISION EXERCISE: 22

Simplify the following:

1: (k +1) + (2k+3)

2: (2m + 3) + (4m + 4)

3: (3y + 5) –(2y +2)

4: (4r + 6) –(r +3)

5: (7m –1) + (2m – 5)

6: (8k –2) + (3k – 4)

7: (10p –6) –(3p – 6)

8: $^{2}/_{3}$(6a + 9b) – $^{1}/_{2}$(4a + 2b)

9: 4(f +5) + 3(f +7)

10: 5(2n +3) + 2(n – 6)

11: 6(3m + 4) – 2(5m +10)

12: 7(p – 2) + 2(p + 4)

13: 9(2 + a) + (6 – 4a)

14: 3(y + 8) –2(y +10)

15: 4(t + 2) – 3(t – 4)

16: 5(m –3) –2(m +4)

17: 4(k +2) –3(k –2)

18: 5(x – 4) – 4(x – 6)

19: 2(n –1) + 3(n –2)

20: ¼ (16m +12w) –$^{1}/_{3}$(6m + 6w)

EQUATIONS:

An equation is a mathematical statement, which states that the sides are equal

REVISION EXERCISE: 23

Solve the following equations

1: $2m + 3m = 20$

2: $2x + 4 = x + 11$

3: $^{2}/_{3}\ P = 4$`

4: $(p - 3) + (p - 4) = 1$

5: $4\ ^{1}/_{3}\ x + 2 = 15$

6: $m + {}^{m}/_{5} = 6$

7: $5(t - 2) - 3(t - 4) = 14$

8: $3(y - 1) = 21$

9: $6(k - 2) + 3(k + 1) = 0$

10: $0.4k - 0.8 = 2.4$

11: $7(2r - 5) - (r + 8) = {}^{-}17$

12: $(2p - 5) - (p + 9) = 12$

13: $5(a - 4) + 3 + 2(a - 3) = 33$

14: $5(3 - 4k) - 8(2k + 4) = 19$

15: $2\ ^{1}/_{3}\ n + 2 = 9$

16: $4p + 0.5 - 0.2p = 8.1$

17: $^{6}/_{11}p - 3p = 54$

18: $\frac{3y - 1}{2} = \frac{7y + 1}{6}$

19: $2/3(6a + 9) + 2/5(5a - 10) = 26$

20: $\frac{3}{4}(8m + 4) - {}^{1}/_{3}(6m - 9) = 18$

REVISION EXERCISE 24:

Solve the following:

1: $\frac{4}{x + 1} = \frac{3}{x - 3}$

2 $\frac{x + 6}{8} + \frac{x}{4} = 3$

3: $\frac{y - 1}{2} + \frac{y}{5} = 3$

4: $\frac{n - 5}{2} + \frac{n}{8} = 5$

5: $\frac{x + 3}{3} = \frac{5x + 1}{9}$

11: $\frac{4x - 5}{7} = \frac{5x - 4}{11}$

12: $\frac{n - 3}{4} = \frac{n + 2}{9}$

13: $\frac{y - 4}{y - 2} = \frac{2}{3}$

14: $\frac{x - 4}{5} = \frac{4}{5}$

15: $\frac{x - 11}{3} = \frac{x - {}^{-}1}{5}$

6: $\frac{x-3}{3} = \frac{x+3}{5}$

7: $\frac{3y-8}{4} = \frac{2y-3}{5}$

8: $\frac{y+2}{5} = \frac{y+4}{7}$

9: $\frac{k+2}{9} = \frac{k+4}{11}$

10: $\frac{3m+2}{2} = \frac{6m+11}{5}$

16 $\frac{x+5}{5} + \frac{x}{5} = 5$

17: $\frac{3k-2}{10} = \frac{k}{5}$ 1:

18: $\frac{t-2}{8} = ¼$

19: $\frac{1}{3}(2m-5) = \frac{m-2}{2}$

20: $\frac{1}{5}(2r+3) = \frac{1}{3}(r+2)$

REVISION EXERCISE 25:

1: Solve; $t - 8 = 12$

2: Simplify: $-2(x + 2y)$

3: If $^1/_3$ of a number is 7. Find the number

4: Simplify:3m-6n +2m

5: Solve: $n + 4 = 11$

5: The mean of 2a,3,6 and 7 is 8 .Find a

7: The range of two numbers is 2. if the bigger number is −3, find the smaller number.

8: Given that a =4, b=1 and c = 3 Find: a) 3(a + b)

9: Simplify the following: a) $^2/_5(15m - 20p)$, (b) $-3(-x-4)$ (c) $^2/_3(6a + 12b)$

10: Solve: $4/7\,x - 2x = -10$

11: ½ $m^2 = 18$

12: Given that ½ of a number is 20. Find the number.

13: When a number is multiplied by 5 and 8 is added to it the result is 23. What is the number?

14: Kato has x pens, Peter has 2x pens and John has 9pens. If the total number of pens which they have is 18. How many pens has Kato?

15: Alice is (k+2) years old, her father is twice as old. If their total age is 36 years, how old is Alice?

16: A book costs shs. 4,000 more than a pen. If their total cost is shs 24,000. Find the cost of each item.

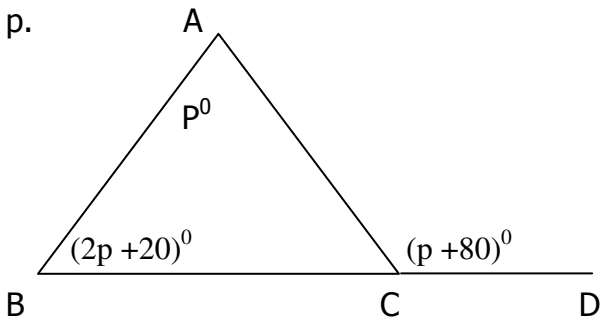
17: Among is 4 years younger than Acham, if their total age is 18 years. What are their ages?

18: A goat and a cock cost shs. 64,000. If the goat costs three times the cost of the cock. What is the cost of each?

19: Rose is 6 years younger than Betty. If their total is 24 years. How old is each now

20: In the figure below find the value of p.

b) What is the size of angle ACD?



REVISION EXERCISE 26:

1: Simplify: $12m^7 \div 3m^3$

2: Solve: $5(n+4) = 30$

3: Solve: $1/8\ k^2 = 2$

4: Solve: $1/7m^2 = 28$

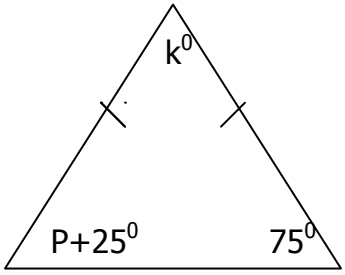
5: Subtract: a) $x - 1$ from $2x\ 2$

6: Simplify: a) $15n^9 \div 5n^3$

7: If ¾ of Peter's income is shs.120, 000. What is his income?

8: Solve the following: a) $^1/_5\ t - 7 = 10$

9: The figure below is an isosceles triangle.



(I) Find the value of p i

(ii) What is the size of the angle marked k

10: Work out: b) $\frac{3a-4}{2} + \frac{2a+7}{5}$

11: Work out: a) $25a^9 \div 5a^6$ b) $\frac{4m \times 3m^4 \times 2x^3}{12m^5}$ c) $2^{-2} + 3^{-2}$

12: Solve: a) $2n - 4 = 16 + n$ b) Solve: $12 - p = 2p$ c) $3(x-1) - 3(3-x) = 0$

13: A hen costs shs.2000 less than a cock. If both birds cost shs.16000. What is the cost of each?

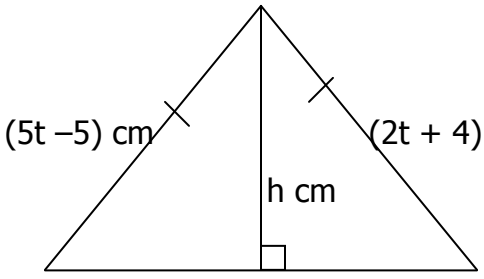
14: Think of a number, add 2 to it and divide the result by 3. if the answer is 4 what is the number?

15: A man bought 5p cows; he sold 3p of the cows. Later his brother gave him 5p cows. If now he has 21 cows. Find the value of p.

16: A ball and a pair of boots cost shs 150,000. If a ball costs twice as much as a pair of boots find the cost of each.

17: The length of a rectangle is twice its width. If its perimeter is 30 cm.
Find: (i) Actual length of the rectangle.
(ii) Actual width of the rectangle.(iii) Calculate its area.

18: Study the figure carefully and answer the questions that follow.



a) Find the value of t
b) Find height
c) Work out its area.
d) Find its perimeter

19: Okello has 2(m + 3) heads of cattle on his farm. Musana has 20 more heads of cattle than Okello. If they have altogether a total of 64 heads of cattle, find out how many each has.

20: It takes a motorist y + 3 hours to travel from Kampala to Masaka. If it takes him one hour more to travel from Masaka to kisoro and the whole journey took him 6 hours. a) Find the value of y

b) If the distance from Kampala to Kisoro is 420 km. At what speed was the motorist traveling?

REVISION EXERCISE 27:

1: Simplify: $4a + 11a - 2a$

2: Simplify: $8m + 3m - 12$

3: Solve: $n - 2 = 4$

4: Work out: $3k - 2m + 4k + 5m$

5: Solve: $\frac{n}{3} - 4 = 7$

6: Solve: $\frac{1}{4} y^2 = 400$

7: Simplify: $2(4m - 7b)$

8: Work out $\frac{5a^{10} \times 12a \times 3a^6}{9a^7}$

9: Solve: $2^{2x} = 64$

10: $\frac{3}{5}$ of a number is 12. Find $\frac{1}{4}$ of the number.

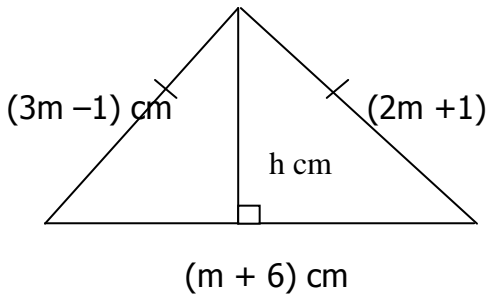
11: Work out: $4(p + 1) - 3(p - 4)$

12: The three sides of a scalene triangle are 3m cm, 5m cm and 4m cm. If the perimeter of the triangle is 48cm

a) What is the value of m? b) Find the range of the sides.

13: A book and a pen cost shs. 4800, if the cost of the book is twice the cost of the pen find the cost of each item.

14: The figure below is an isosceles triangle.



a) Find the value of m

b) Work out its perimeter

c) Calculate its area.

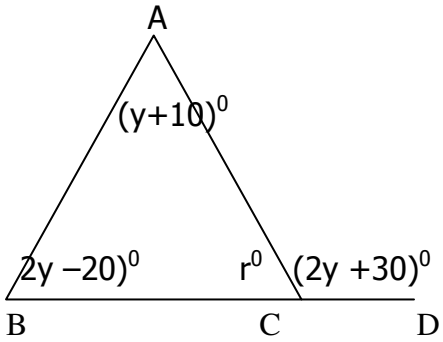
15: Kato is12 years old and Okello is 4 years old. In how many years' time will Kato's age be twice the age of Okello?

16: The area of a rectangular garden is 72 $m^{2.}$ If the length is twice the width, Find
a) The length. b) The width, c) The perimeter.

17: Aida is twice as old as Amina who is 2 years older than Saida. If Saida is 9 years old, what are the ages of Aida and Amina?

18: Akello is 30 years older than her daughter. In 5 years' time Akello will be twice as old as her daughter .a) What are their present ages? b) What will be their ages in 5 years' time?

19: Study the figure below carefully and answer the questions that follow



a) Find the value of y.

b) What is the size of angle r?

c) Find the size of angle ACD.

20: Mugisha bought twice as many orange trees as mango trees. If he planted (X – 3) mango trees and he had –planted a total of 240 trees altogether.
a) How many trees of each type did he plant?
b) How many more orange trees did he plant than mango trees?
c) If he paid shs 2500 for each mango tree and shs. 3000 for each orange, how much money did he spend altogether?

MORE APPLICATION OF ALGEBRA.

AGES IN TIME TO COME AND TIME AGO.

Example 1

John is 20 years older than peter. In 10 years time, John will be twice as old as Peter.

a) How old is each of them now? b) What will be their ages in 10 year's time?

Solution: Let Peter's age be x

	Peter	**John**	**In 10 year's time.**
Now	x	(x + 20) years	Peter x + 10
10 years	(x + 10)	= (x + 20 + 10)	10 + 10
time	2(x + 10)	= (x+30)	**20 years old**
	2x + 20 –20	= x + 30 –20	
	2x – x	= x – x + 10	
	x	**= 10**	John **=** x + 30
Now	**Peter = 10 years**.	**John** = x+20	10 + 30
		10 + 20 =**30years**	**40 years old.**

Example 2

A son is 15 years younger than his father. In 6 year's time the son's age will be half the age of the father.

a) How old is each now? b) What will be their ages in 6 year's time?

Solution: Let the son's age be n

	Son	**Father**		
Now	n –15	n	Their ages in 6 year's time.	
6 year's	(n –15 +6)	= ½ of (n + 6)		
time	2(n – 9)	= ½ x2(n +6)	**Father**	**Son**
	2n –18	= n +6	n + 6	n-9
	2n –18 +18	= n + 6 + 18	24 + 6	24 -9
	2n –n	= n – n +24	**30 years.**	**15 years**

n = 24 **Son**

Father = 24 year **son** n –15

24 –15 **<u>9 years old</u>**

Example 3:

Betty is 3 years younger than Mary. 5 years ago Betty was ½ the age of Mary.

a) How old is each now? b) What will be their ages in 5 year's time?

Solution: Let Betty's age be k

	Betty		**Mary**	**Their ages 5 years ago.**
Now	k –3		k	
5 years	(k –3 –5)	=	½ (k –5)	Betty = k –8
ago	2(k – 8)	=	(k –5)	= 11 –8
	2k –16 +16	=	k – 5 + 16	= Was 3 years old.
	2k – k	=	k – k + 11	
	k	=	11	Mary = k –5
	Mary = 11 years.		Betty = k –3	=11 –5
			11 –3 = **8 years.**	**= <u>was 6 years</u>**

<u>old.</u>

Example 4:

A daughter is 3 years old and the mother is 21 years old. In how many years' time will the mother's age be 3 times the age of the daughter?

Solution: Let time to come be y

	Daughter		**Mother**	9 – 9 +3y =21 –9 +y
Now	3 years		21 years.	3y –y = 12 +y – y
Y- years	3(3 + y)	=	(21+ y)	2y/2 = 12/2

9 + 3y = 21 + y y = 6. **In 6year'stime**

Example 5:

Peter is 9 years old and James is 15 years old. In how many years ago was James'

age twice the age of Peter?

Solution: Let time ago be n

	Peter		**James**.	Ago	18 –2n	= 15 – n
Now:	6 years		15 years.		18 –2n + 2n	= 15 –n +2n
n years	2(9 – n)	=	(15 – n)		18 –15	= 15 –15 =n
					3	= n
					It was 3 years ago	

Example 6:

The length of a rectangular garden is 3 times its width. If the difference of its dimensions measurements is 36 metres Find it's a) Length and width. b) Perimeter c) Area

Solution: Let the width be x

Length.		**Width**		Perimeter = 2(54 + 18)m
3X		X		**=** 2 X 72
3X – X	=	36	=	**= 144 metres**.
$\frac{2X}{2}$	=	$\frac{36}{2}$		
x	=	18		Area = 54 m X 18m
				= 972 m^2

Width =**18 metres** Length= 18 X 3

= **54 metres**

REVISION EXERCISE 28:

1**:** A father is 20 years older his son .In 10 years time a father will be twice the age of his son.

a) Calculate their present ages. b) What will be their ages in 10 years' time?

2: Solve and find the solution set, $3 - 3k \geq 15$

3: Atim is 15 years younger than Peter. In 5 years time Peter's age will be twice the age of Atim.

a) Find their ages now. b) How old will each be in 5 years' time?

4: John is 15 years younger than Tom. In 8 years' time John's age will be half the age

of Tom's age? a) How old is each of them now? b) What will be their ages then?

5: Andrew is 28 years old and Mondo is 4 years old. In how many years will Mondo's age be $^1/_3$ times the age of Andrew?

a) How old will each be then?

6: A son is 20 years younger than the mother. In 15 years time the son will be half the age of the mother

a) Calculate their present ages. b) What will be their ages in 15 years' time?

7: Annet 15 years older than Jane. In 8 years time a mother will be twice as old as the daughter a) Calculate their present ages b) How old will each be then?

8: A father is 3 times as old as his son .In 10 years time the son will be half the age of the father.

a) Calculate their present ages. b) Work out their ages in 10 years' time.

9: Peter is 18 years older than John now .10 years ago Peter was twice as old as John

a) How old is each of them now?

10: Annette is 12 years younger than Musa now. 6 years ago Annette's age was ½ the age of Musa. a) Work out their present ages.

11: Mary is 16 years younger than Susan now. 8 years ago Mary was $^1/_3$ the age of Susan.

a) How old is each of them now?

b) What were their ages 8 years ago?

12: Mary is 10 yeas old and Aisha is 30 years old. a) In ho many years' time will Mary's age be half the age of Aisha? b) What will be their ages then?

13: A trader bought 8 radios at shs. (t –13000) each and 2 bicycles at shs. (t –2000) each. If he spent shs.530, 000 for buying the items.

a) How much did he spend on radios? b) What did he spend on bicycles?

14: The mean of 3 consecutive even numbers is 16.

a) Work out: a) numbers. b) Their range c) their median

15: The length of a rectangular garden is 4 times its width. If the difference of its measurements is 48 metres.

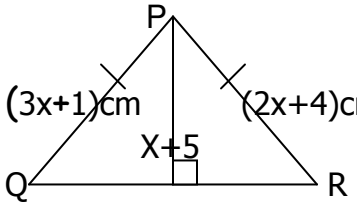
a) Work out its perimeter. b) Calculate its area.

16: a) The mean of 4 positive integers is 9.5.Work out the median of the numbers

b) The range of two consecutive numbers is 2.If the bigger numbers is –3. Find the smaller number

d) The sum of three consecutive counting numbers is 45. Find the numbers

17: The figure PQR is an isosceles triangle use it to answer questions that follow.

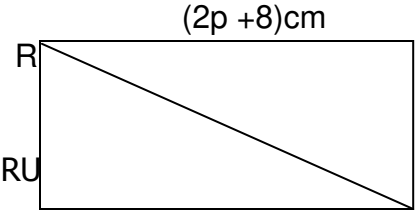


a) What is the value of x

b) Work out its area?

c) Find its perimeter

18 The three sides of a rectangle taken in order are: (4p +4), (2p + 1) and (2p+8)cm respectively as shown below.



a) Find the value of p

b) What is the length of the diagonal RU

c) Calculate the area of the triangle

19: The mean of 6 consecutive numbers is 4 ½, a) Find the numbers.

b) Work out their median.

20: Solve and find the solution set; $^{-}4 \leq 2x \leq 8$

REVISION EXERCISE 29:

1: Work out: $^{t}/_{3} = 12$

2: Solve: $4 - p = 3$

3: Solve: $2q^2 - 4 = 14$

4: What must be added to $y + 4$ to get $2y + 10$?

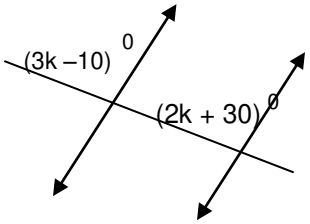
5: Subtract $r - 4$ from $3r - 7$

6: Solve: $\frac{m+2}{3} + \frac{m}{3} = 4$

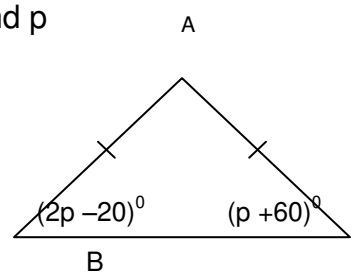
7: Simplify: $\frac{40p^5 - 10p^5}{15p^2}$

8: The LCM of two numbers is 48 and their GCF is 4. If the first number is 16, find the other number.

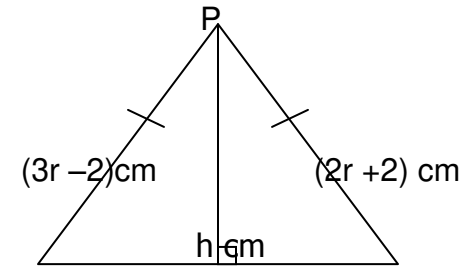
9: Find the value of k



10: Find p



11:



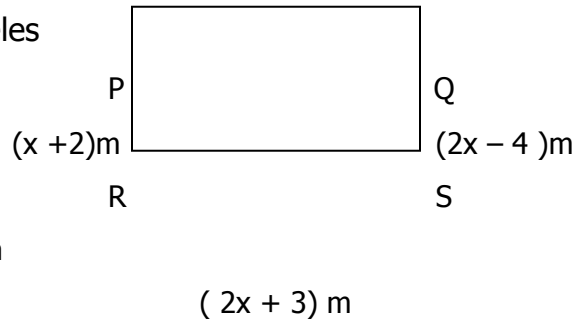
In the figure beside find: a) The value of r

b) The perimeter

c) The height

d) Its area

12: The figure PQRS is a rectangular plot of land.



a) Find the actual value of the:

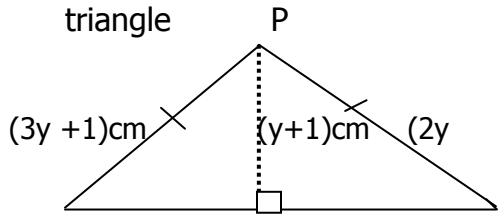
X ii Length (iii) Width

(i)

a) Work out its perimeter

b) d) Find its area.

13: The figure below is an isosceles triangle

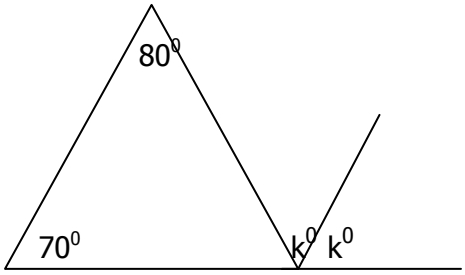


a) What is the value of y

b) Work out its area?

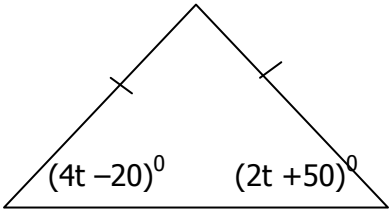
c) Find its perimeter.

14: In the figure below find the value of k

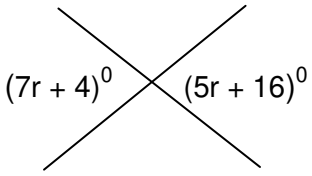


15: The figure below is an isosceles triangle

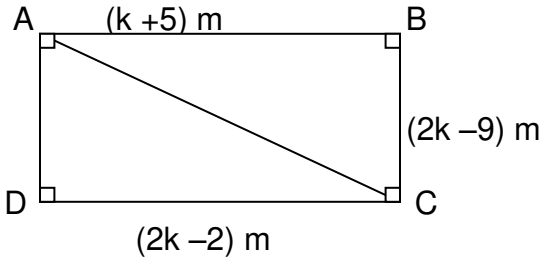
Find the value of t



16: Find the value r in the figure below



17: The figure below is a rectangular garden



a) Find the value of k b) What is its Length and width.

c) What is its perimeter? d) Calculate its area.

e) Work out the length of the diagonal AD

18: Solve and find the solution set:

a) $2(y - 2) \geq 6$ b) $-15 \leq 3x \leq$

19: Solve and find the solution set.

a) $^3/_5\, x - 4 \leq -1$ b) $-\frac{3}{4}\, y - 2 < 1$

20: Solve and find the solution set:

a) $2(q - 2) > 4$ b) $9 \geq 2x + 1 \geq -3$

ANSWERS

REVISION EXERCISE 20

1:	4p	6:	20p	11:	10y	16:	x =5
2:	5b + a	7:	9xy + 4ac	12:	3p + 6k	17:	2y –1
3:	n = 3	8:	y =3	13:	3	18:	8m + 3n
4:	6x + 10	9:	4a + 3b	14:	18	19:	n =4
5:	7m – k	10:	$10m^2$	15:	$-ab^2$	20:	2w + 3t

REVISION EXERCISE 21

1:	–2m – 2n	6:	8a –12b	11:	8x –2	16:	– 6x
2:	–3ay – by	7:	$3p^2$ –7yp	12:	4p + 4	17:	5a + 9b
3:	8ya + 4yb	8:	2x + 8	13:	2q + 18	18:	2n + 20
4:	5p + ap +cp	9:	– 8m	14:	x –2	19:	8m –7
5:	$12zy - 15z^2$	10:	4y + 8	15:	x + 2	20:	t + 2

REVISION EXERCISE 22

1:	3k + 4	6:	11k – 6	11:	8m + 4	16:	3m –23
2:	6m + 7	7:	7p –12	12:	9p – 6	17:	k + 14
3:	y + 3	8:	2a + 5b	13:	5a + 24	18:	x + 4
4:	3r + 3	9:	7f + 41	14:	y + 4	19:	5n – 8
5:	9m – 6	10:	12n + 3	15:	t + 20	20:	2m + w

REVISION EXERCISE 23

1:	m = 4	6:	m = 5	11:	r =2	16:	p = 2
2:	x = 7	7:	t = 6	12:	p = 26	17:	p = $^{-}$22
3:	p = 6	8:	y = 8	13:	a = 8	18:	y = 2
4:	p = 4	9:	k =1	14:	k = $^{-}$1	19:	a = 4
5:	X = 3	10:	k =8	15:	n = 3	20:	m =3

REVISION EXERCISE 24

1:	x=15 k=2	5:	x=4	9:	k=7	13:	y=8	17:	
2:	x= 6 t=4	6:	x=12	10:	m=4	14:	x=8	18:	
3:	y=5 x=4	7:	x=4	11:	x=3	15:	x=29	19:	
4:	x=8 r=1	8:	y=3	12:	n=7	16:	x=10	20:	

REVISION EXERCISE 25

1: t =20

2: –2x – 4y

3: no. is 21 yrs.

4: 5m – 10n

5: n =7

6: a =8

7: smaller no –5

8:a) 15, (b) 14, (c) 17

9:a) 6m – 8 p (b) 3x +12

10:a) X =7

11: m =6

12: no. is 40

13: x =3

14: Kato =.3 pens

15: Alice is 12 years.

16: Pen10, 000/=, Book 14000/=

17: Among 7 yrs. Acham 11 yrs.

18: Cock=16,000/=. Goat 48000/

19: Betty is 15 y
Rose 9 yrs

20: p =30. (b) Angle ACD =110^0

REVISION EXERCISE: 26

1: $4m^4$

2: n =2

3: k =4

4: m =14

5: x +3

6: $6m^3$

7: 160,000/=

8: t =50

9: p=50, k =30^0

10: $\frac{19a - 6}{10}$

11:a) $5a^3$, (b) $2m^3$ (c) $^{13}/_{36}$

12:a) n=20, (b) p=4, (c) x=2

13: Cock = 9000/=

14: n =10

15: p=3=,

16: Ball 100,000/=
Boots 50,000/=

17: Length =10 cm, Width=5cm
Area = $50cn^2$

18: a) t =3 (b) height = 8cm
Area = 48 cm^2
Perimeter = 32 cm.

19: Okello has 22 heads of cattle
Musana has 42 heads of cattle

20: y = 2
b) Speed was 70 km/hr

REVISION EXERCISE 27

1: 13a 9: x = 3 14: a) m =2 19: a) y= 40,(b) r=70^0

2: 11m – 12 10: No. is 20 b) Perimeter =18cm c) <ACD=110^0

3: n = 6 11: p +16 c) Area = 12 cm^2 20: 80 mango trees

4: 7k + m 12: m= 4 15: in 4 years' time 160 Orange trees

5: n = 33 b) Range = 8 16: Length=12 m, b) 80 more orange trees

6: y =40 13: Pen = 16,000/= b) Width =6m, c) 680,000/=

7: 8m – 14b b) Book =32,000/= (c) Perim. =36m

8: $20a^{10}$ 17: **Aida** =22yres, **Amina**=11yrs.

18: **Now:** Daughter =25 years

Akello = 55 years.

(b) 5 years' time: Daughter =30 years

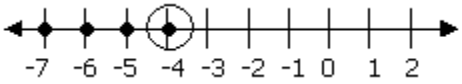
Akello = 60 years

REVISION EXERCISE 28

1: **Now** Son = 10 years, Father =30years

10 years' time: Son = 20 years

Father = 40 years

2: 

Solution set K: K < - 4 = {…-7-6, -5,-4}

8: **Now**: Son =10 years

Father= 30 years.

In10 years' time: Son =20

Father = 40 years.

9: **Now** John = 28 years

Peter = 46 years

10 yrs ago: John was 18 yrs

3: **Now**: Peter =25 years, Atim =10 years. Peter was 36 years.

b) In 5yr's time: Peter =30 yrs, Atim = 15 yrs.

4: **Now:** John =7years, Tom = 22 years.

a) In 8 yrs time John =15 years

years

Tom = 30 years.

years.

5: It will be in 8 years' time.

Mary=16,Susan=32yrs

b) Mondo will be 12 years.

years

c) Andrew will be 36 years.

years.

6: **Now:** Son = 5 years

Mother = 25 years.

b) In 15 yrs time: Son = 20 years.

mother = 40 years.

7: **Now:** Jane= 6 years, Annet=20 years.

Their ages then: Jane will be 14 years.

Annet will be 28 years.

15: Perimeter = 160 metres

Area = 1024 m^2

16: median = 9.5

Smaller no = $^{-}$ 5

10: **Now**: Musa = 30 years.

Annet = 18 years.

6 yrs ago: Musa was 24

Annet was 12

11: **Now:**

8 yrs ago: Mary was 8

Susan was 24

12: **In 10 years' time**

Mary=20yrs,Aisha=40yrs.

13: Radios = 400,000/=

Bicycles = 130,000/=

14: Nos. are 14, 16, 18.

Range = 4

Median = 16

18: p = 2

RU = 13 cm, Area =30cm

19: The numbers are:

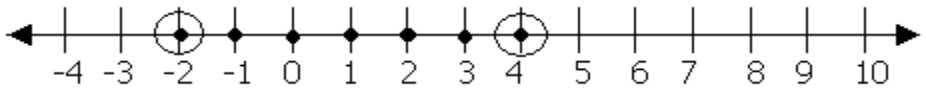
2, 3, 4, 5, 6 and 7

Nos. are: 14,15 and16 Median = 4.5

17: x=3 Perimeter= 32 cm

Area = 48cm

20: $-2 \leq x \leq 4$



Solution set X : X = { -2, -1, 0, 1, 2, 3, 4}

REVISION EXERCISE 29

1: t = 36
2: p = 1
3: q = 3
4: y + 6
5: 2r –3
6: m =5
7: $2p^3$
8: 12
9: k = 40
10: p =80

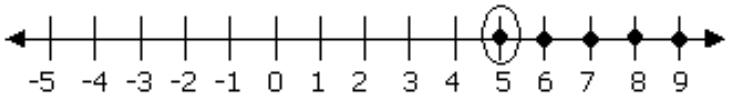
11: r= 4
perimeter = 32 cm
Height = 8cm
Area = 48 cm^2

12: x =6, Length =15cm
Width = 8cm
Perimeter = 46 cm
Area = 120cm^2

13: y = 4
Area = 60cm^2
Perimeter = 50cm

14: k = 75
15: t = 35
16: t = 6
17: k =7
Length= 12 cm
Width = 5cm
Perimeter =34 cm
Area = 60cm^2
Diagonal AD = 13 cm.

18:a) $y \geq 5$

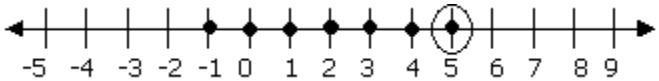


Solution set y: y ={5, 6, 7, 8, …….}

18b) i) $-5 \leq x \leq 2$

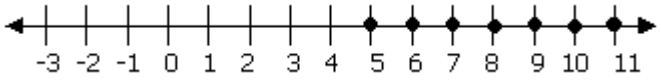
Solution set: X : X = { -5, -4, -3, -2, -1, 0, 1, 2}

19:a) $X \leq 5$



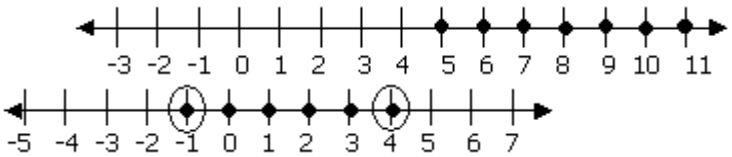
Solution set: X: X = { …..-1, 0, 1, 2, 3, 4, 5}

19b) $y > 4$



Solution set: $y : y = \{4, 5, 6, 7, ...\}$

20: a) $q > 4$ 20 b) $4 \geq x \geq -1$



Solution set q: $q = \{5, 6, 7, 8, \ldots\}$ Solution set X : $X = \{ -1, 0, 1, 2, 3, 4\}$

Topic : **CURRENCY.**

Finding the number of notes in a bundle.

Example 1:

If bank notes are numbered from AP 003782 to AP 0038881. How many notes are there?

Working: (First Note subtracted from Last Note)

0 0 3 8 8 1
- 0 0 3 7 8 2

9 9 + 1 = 100 Notes.

Exercise:

1. Ben has a bundle of notes numbered from AP 004300 to AP 004399. How many bank notes does Ben have?
2. Muna has bank notes numbered from AX 004810 to AX 004910. How many bank notes does Muna have?
3. Find the number of bank notes numbered from:
   i. KJ 00700 to KJ 00891 ii. YQ 00666 to YQ 00696
   iii. UG 03344 to UG 03411

CALCULATING THE AMOUNT OF MONEY IN A BUNDLE.

Example 1:

Lala has bank notes of 1000/= numbered from AP 004300 to AP 004399.

a). How many bank notes does Lala have?
b). How much money does Lala have?

AP 0 0 4 3 9 9 Amount of money in a bundle:
- AP 0 0 4 3 0 0 100 notes x 1000/=

9 9 + 1 100,000/=

100 notes.

Exercise 1:

1. Taha had bundle of 1,000 shilling notes numbered from AC 502830 to AC 502839. How much money does he have?
2. 5,000 shilling notes are numbered from AC 412389 to AC 412397. How much money is this?
3. Ngobi has 10,000 shilling notes numbered from MT 301422 to MT 301437. How much money has Ngobi?
4. A school bursar is paying salary to teachers. How many 1,000/= notes will he give to a worker who gets a salary of Shs. 90,000?
5. How many 500 shilling coins are equivalent to one ten thousand shilling note?

More practice exercises on page 281 MK 6.

Week II- Topic: **CHANGING FROM UGANDA CURRENCY TO OTHER CURRENCIES / VIS-VASA.**

Example 1:

If 1 US dollar is bout at Ug Sh. 1700/= and sold at 17,200. How much will a tourist get from US $ 650 when he is in Uganda?

Working: **1 US $ = 1720**
650US$ = 1720 x 650
= 1,118,000/=

Example 2:

Musa has Ug Sh. 340,000/=. How many US $ will he obtain from this amount?

17000 Ug Sh = 1 US $

340,000 Ug Sh = $\frac{340,000}{1700}$

= **200 US $**

Exercise:

Use the table given below to answer the questions that follow.

CURRENCY	BUYING	SELLING
1 US $	Ug Sh 1700	Ug. 1,720
1 K Sh.	Ug Sh. 19	Ug Sh. 20

1. Daddy has 860,000/=. How much money in dollars does he have?
2. Convert Ug Sh. 34,000 to Kenya shillings.
3. Nambi sold 10kg of maize to a Kenyan lady at K Sh. 21 per kg. How much money did she get in Uganda shillings?

4. A lorry driven transported coffee from Kampala to Nairobi for Ush. 380,000. How much money did he get in K Sh?

5. Convert 510,000/= (U Sh) to dollars using the rate given in the table above.

More practice work on page 220 MK 6

USING GRAPHS TO CHANGE CURRENCY.

1. The graph below shows the exchange rate of Uganda shillings against US dollar. Use it to answer the questions that follow.

a). How many Ug Sh are equivalent to US $ 7?
b). Convert US $ 7.5 to Ug Sh.
c). Nakku bought a dress at U Sh. 6500/=. How much money did she spend in dollars?
d). How many Ug Sh. Are equivalent to US $ 9.5?
e). If Musa bought a radio at US $ 11.5, how much did he spend in Ug Sh?
f). Given that 1 US $ costs Ug Sh. 1,035, how many dollars will I get for Ug Sh. 67,275?

Topic: **SPEED,DISTANCE AND TIME**

Finding the distance travelled.

Example 1: Find the distance traveled by a car in 3 hrs at 60km/hr.

S = 60kph

T = 3 hrs

D = S x T

= 60kph x 3 hrs

= **180km.**

Example 2 : A bus travelled at 120kph for 45 minutes. Find the distance covered.

S = 120kph

T = 45 min. = 45/60 hrs

D = S x T

= 120kph x 45/60 hrs

= **90km**

Exercise: Calculate the distance covered.

i. A speed of 30kph for 4 hrs.
ii. A speed of 80kph for ½ hr.
iii. A speed of 80kph for 1 ½ hrs.
iv. A speed of 160kph for ¼ hr.
v. A speed of 55kph for 3 hrs.
vi. A speed of 120kph for 20 min.
vii. A speed of 60kph for 40 min.
viii. A speed of 140kph for 30 min.

More practice exercises on page 229 – 230 MK 6.

Finding time taken.

Example 1: How long will a car take to cover a distance of 120km at a speed of 40kph.

D = 120km
S = 40 kph

$$\text{Time} = \frac{D}{S}$$

$$= \frac{120\text{km}}{40\text{kph}}$$

= **3 hrs.**

Exercise: Calculate the time taken.

1. A distance of 80km covered at 20km/hr.
2. A distance of 350km covered at 60kph.
3. A distance of 120km covered at 40kph.
4. A distance of 140km covered at 70kph.
5. A distance of 140km covered at 70kph.

More practice exercises on page 231 – 233 MK 6 and MK 7.

CALCULATING HOW MUCH LONGER.

Example 1: A car covered a distance of 120km at an average speed of 60km/hr. How much longer

does it take if it moves at 40km/hr?

$T = \frac{D}{T}$	$T = \frac{D}{T}$	Difference
$= \frac{120km}{60kph}$	$\frac{120km}{40kph}$	3 – 2 = 1 hr longer
= 2 hrs	**= 3 hrs**	

Exercise:

1. At 30kph a car can cover a distance of 750km. In how many hours can the same car cover the same journey at 50kph?
2. At 40km/hr a car can cover a distance of 240km. How many hours less can the same car cover the journey at 60km/hr?
3. How many more hours will a car traveling at 70km/hr take to cover a 350km journey if its average speed is reduced to 50km/hr?
4. A distance of 360km can be covered at a speed of 90kph. How much longer will the same distance be covered at 40kph?

More practice exercises on page …

Finding Speed.

Example 1: A car travels for 3 hrs to cover a distance of 210km. At what speed does the car travel?

$S = \frac{D}{T}$

$= \frac{210km}{3hrs}$

= **70kph**

Exercise:

1. Study the table below and answer the questions that follow.

	Distance	Time taken	Speed
a	160km	4 hrs	
b	120km	2 hrs	
c	180km	4 hrs	
d	200km	4 hrs	
e	264km	3 hrs	
f	360km	9 hrs	
g	450km	5 hrs	

2. A bus traveled for 2 hrs to cover a distance of 120km. At what speed was the bus traveling?

3. At what speed was the car traveling to cover a distance of 320km in 4 hours?
4. A bus traveled for 30 minutes to cover a distance of 60km. Calculate its speed.

EXPRESSING KPH AS METRES PER SECOND.

Example 1: Express 72km/hr as m/sec.
Change km to metres and hours to seconds.
1km = 1000m , 1 hr = 3600 sec.

$$72\text{kph} = \frac{72 \times 1000\text{m}}{1 \times 3600\ \text{sec}}$$
$$= \frac{20\text{m}}{1\ \text{sec.}}$$
$$= \mathbf{20m/sec.}$$

Example 2: Express 360km/hr as m/sec.
Change km to metres and hrs to seconds.
1km = 1000m , 1hr = 3600 sec.

$$360\text{kph} = \frac{360 \times 1000\text{m}}{1 \times 3600\ \text{sec}}$$
$$= \frac{100\ \text{m}}{1\ \text{sec.}}$$
$$= \mathbf{100m/sec.}$$

Express the speed below in m/second.

1.	36km/hr	2.	54km/hr	3.	72km/hr	4.	252km/hr
5.	396km/hr	6.	90km/hr	7.	144km/hr	8.	216km/hr
9.	432km/hr	10.	756km/hr				

Changing speed from m/sec to km/hr.

Example 1: Change 20m/sec to km/he.

First change m to km and seconds to hrs.

1000 m = 1 km , 3600 sec. = 1hr

$$20\text{m} = \frac{20}{1000}\ \text{km}$$
$$1\ \text{sec.} = \frac{1}{3600}\ \text{hr}$$
$$20\text{m/sec} = \frac{20}{1000} \times \frac{3600}{1}\ \text{kph}$$
$$= 2 \times 36\ \text{kph}$$
$$= \mathbf{72kph.}$$

Exercise:

Change from m/sec. to kph.

1.	5m/sec	2.	20m/sec.	3.	30m/sec.	4.	40m/sec.
5.	25m/sec	6.	50m/sec	7.	70m/sec.	8.	60m/sec.

FINDING THE AVERAGE SPEED.

Example 1: A car takes 3 hours to cover a certain journey at 60kph but it takes only 2hrs to return through the same distance. Calculate the average speed for the whole journey.

Going	**Return**	**Average Speed to & fro.**
D = S x T = 60 x 3 = 180km	S = D ÷ T = 180/2 = 90kph	AS = Total D / Total T = (180 + 180) km / (3 + 2) hr = 360km / 5 hr = **72kph**.

Exercise

1. A car takes 2 hours to cover a certain distance at 60kph but it returns in 3 hrs. Calculate the average speed of the car for the whole journey.
2. Kampala is 140km from Masaka. A car takes 3 hrs to travel from Kampala to Masaka and 2 hrs coming back. Calculate the average speed for the whole journey.
3. Lira is 124km from Kitgum. A bus takes 1 ½ hrs from Kitgum to Lira and 2 ½ hrs going back. Find its average speed.
4. A lorry takes 4 hrs to travel from Kampala to Lyantonde at 45kph, but it returns in 6 hrs. Calculate the average speed for the whole journey.

More practice exercises on page 238 MK 6.

INTERPRETING TRAVEL GRAPHS.

A motorist traveled from A to B for 2 hrs at a speed of 80km/hr. He rested at B for 1 hr and continued to C at 100kph for another 2 hrs. Study the graph carefully.

Travel Graph.

a). What is the scale on the vertical axis?
b). What is the distance from A to B?
c). What happened at B?
d). What is the distance from B to C?
e). At what time did he arrive at C?
f). What time did he take from A to B?
g). Calculate the motorists average speed for the whole journey.

Practice work on page 240 MK 6.

GRAPHS AND GRAPHS INTERPRETATION.

Finding the mode and modal frequency.

Example: Jane got the following marks in nine tests; 8, 2, 6, 4, 5, 6, 9, 6, 2.

a). Find the modal mark. b). Find the modal frequency.

Number	Tally	Frequency
8		1
2		2
6		3
4		1
5		1
9		1

a). mode = 6 b). modal frequency = 3

i. What is mode? ii. What is modal frequency?

Work out:

Find the mode and modal frequency of the following:-

a). 1,0, 3, 04, 4, 3, 4, 1 b). 4, 3, 3, 4, 6, 7, 7, 0, 4 c). 6, 7, 5, 8, 4, 7, 6, 7

d). 1, 0, 4, 0, 3, 3, 4, 0 e). 3, 3, 3, 4, 4, 5, 5, 5, 6, 5

Find the median and range.

Example 1: Given that A = {2, 4, 6, 7, 8, 3}.

a). Find the median. b). Find the range of the number above.

a). **Median**:

Order of size: 2, 3, 4, 6, 7, 8

Median = $\frac{4 + 6}{2}$ (**Since there are 2 numbers in the middle)**

= $\frac{10}{2}$ = Median = **5 Answer.**

b). **Range:** Range = highest – smallest

8 – 2 = **6 Answer.**

a). What is the median?
b). What is the range?

Exercise: Find the median and range of the following;

a). 5, 7, 2, 8, 7 b). 7, 3, 1, 9, 5, 8, 7 c). 8, 4, 0, 8, 4, 7, 6, 7, 8

d). 6, 4, 4, 1, 5, 0, 8 , 9, 3 e). 1, 3, 5, 7 5, 3, 1 f). 6, 4, 8, 1, 5

Find the mean.

Example 1: Find the arithmetic mean of; 2, 4, 7, 2, 8 and 1?

Mean = $\frac{\text{Sum of items}}{\text{No. of items}} = \frac{2 + 4 + 7 + 2 + 8 + 1}{6} = \frac{24}{6}$ = **4 Answer.**

Work out: Find the mean of the following.

1. 3, 6, 7, 4, 5 2. 4, 2, 6, 8 3. 5, 7, 2, 6, 10, 6

4. 7, 8, 7, 8, 5, 2, 5 5. 10, 12, 14, 10 6. 5, 10, 8, 7, 4, 8

Inverse problems on average.

Example: The average of 5 numbers is 6. What is the sum of these numbers?

$A = \frac{S}{N} = N \times A = \frac{S}{N} \times N$

S = No. x Average

5 x 6 = **30 Answer.**

Work out on MK 6 Pg 172.

More inverse problems.

Example 2: The average mark of 4 pupils if 6 and the average mark of 4 other pupils of 8.

What is the average mark of all the pupils?

1st total = (4 x 6) = 24
2nd total = (4 x 8) = 32
All total = 32 + 24 = 56
Total No. = 4 + 4 = 8
Av. Of 8 = 56/8
7 Answer.

Work out MK 6 Pg 173.

TABLE INTERPRETATION

Mark	50	40	30	70
No. of pupils	2	1	3	1

The above table shows marks got by pupils of a P.6 class at Kira Parents' School.

a). Find the modal mark. b). Find the range of marks. c). Find the mean.

a). **Mean = Sum / Number = (50 x 2) + (40 x 1) + (30 x 3) + (70 x 1) / 2 + 1 + 3 + 1**

= 100 + 40 + 90 + 70 / 7 = 300 / 7 = 42 6/7 Answer.

Work out:

Table 1, Table 2 on page 175, MK 6.

INTERPRETING PICTOGRAPHS.

A Review Exercise

If o represents 7 fruits, study the pictograph below and answer the questions that follow.

Name	No. of fruits
Kato	o o o o o o o o o o
Hala	o o o o o o o
Pearl	o o o o o o o o o o o o o o o o

a). How many fruits has; i. Kato ii. Hala iii. Pearl

Work out on Pg 163 – MK 6

FRACTIONS

ADDITION OF FRACTIONS

To add fractions, find the LCM of the denominators of the fractions.

Example I

Add: ¼ + ½ **(Find LCM of 2 and 4 by prime factorisation using the ladder)**

$= \frac{(4 \div 4 \times 1) + (4 \div 2 \times 1)}{4}$

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

$= \mathbf{\frac{3}{4}}$

Example II

Add: $^{5}/_{6} + {}^{3}/_{8}$ **(Find LCM of 6 and 8 by prime factorisation using the ladder)**

$\frac{20 + 9}{24} = \frac{29}{24}$ ***(Change to a mixed fraction)***

= $1^{5}/_{24}$

Example III

EXERCISE C 6

Add the following:

1. $^{1}/_{3} + {}^{1}/_{2}$
2. $^{4}/_{3} + {}^{1}/_{2}$
3. $^{7}/_{10} + {}^{1}/_{20}$
4. $^{1}/_{5} + {}^{1}/_{2}$
5. $^{2}/_{7} + {}^{3}/_{4}$
6. $^{2}/_{9} + {}^{1}/_{6}$

ADDITION OF WHOLES TO FRACTIONS

Example I

Add: ¾ + 5

= 5 + ¾

= **5 ¾**

Example II

Add: $3\ ^{2}/_{5} + 7$

= 3 + 7 + $^{2}/_{5}$ **(First add the wholes alone)**

= 10 + $^{2}/_{5}$

= $10\ ^{2}/_{5}$

Example III

Add: $5\ ^{3}/_{7} + 12$

= 5 + 12 + $^{3}/_{7}$ **(First add the wholes alone)**

= 17 + $^{3}/_{7}$

= **$17^{3}/_{7}$**

EXERCISE C 7

Add the following

1. $^{1}/_{5} + 3$
2. $10 + 1^{5}/_{7}$
3. $4\ ^{1}/_{5} + 6$
4. $22\ ^{1}/_{5} + 13$
5. $2\ ^{3}/_{7} + 8$
6. $1\ ^{1}/_{4} + 9$

MORE ON ADDITION

Example I

Add: $6^{2}/_{3} + {}^{5}/_{6}$

= $\frac{6 \times 3 + 2}{3}$ **(mixed to improper)**

= $^{20}/_{3} + {}^{5}/_{6}$ **LCM of 3 and 6 = 6**

Example II

$^{1}/_{15} + 1^{1}/_{3} + {}^{3}/_{5}$ **(mixed to fractions)**

= $^{1}/_{15} + {}^{4}/_{3} + {}^{3}/_{5}$ **(LCM of 15, 3 and 5 = 15)**

= $\frac{1 + 20 + 9}{15}$

$= \frac{40 + 5}{6}$

$= {}^{45}/_{6}$ **Change to mixed fraction**

$= 7^{3}/_{6}$

$= {}^{30}/_{15}$ **(reduce by the HCF)**

$= 2$

EXERCISE C 8

1. $5 + 4^{2}/_{3}$
2. $3^{3}/_{7} + 4$
3. $2^{1}/_{5} + {}^{2}/_{3}$
4. $^{1}/_{15} + 3^{1}/_{2}$
5. $^{3}/_{4} + 4^{1}/_{8} + 2^{5}/_{8}$
6. $^{1}/_{6} + {}^{5}/_{9} + 1^{1}/_{3}$

WORD PROBLEMS INVOLVING ADDITION OF FRACTIONS

Example I

John filled ½ of a tank with water in the morning and $^{2}/_{5}$ in the afternoon. Hat fraction o he tank was full with water?

Morning + Afternoon

$½ + {}^{2}/_{5}$ **LCM of 2 and 5 = 10**

$= \frac{5 + 4}{10}$

$= {}^{9}/_{10}$

The tank was filled with $^{9}/_{10}$

Example II

Abdel had 1½ cakes. Jane had $2^{3}/_{4}$ cakes and Rose had ¾ of a cake. How many cakes did they have altogether?

Abdel + Rose + Jane

$1^{1}/_{2} + {}^{3}/_{4} + +2^{3}/_{4}$ **(Change to improper)**

$= {}^{3}/_{2} + {}^{3}/_{4} + {}^{11}/_{4}$ **(LCM of 2 and 4 = 4)**

$= \frac{6 + 3 + 11}{4}$

$= {}^{20}/_{4}$ (**reduce the fraction to its simplest terms**)

= 5 cakes.

EXERCISE C 9

1. $^{2}/_{3}$ of the seats in a bus is filled by adults and ¼ by children. What fraction of the seats in the bus is occupied?
2. A worker painted 3 $^{1}/_{9}$ wall on Monday and $^{4}/_{9}$ on Tuesday. What fraction of the house was painted on Monday?
3. In a school library, $^{5}/_{15}$ of the books are mathematics, $^{1}/_{6}$ of the books are English and $^{1}/_{3}$ are Science. What fraction do the three books represent altogether?
4. A mother gave sugar canes to her children. The daughter got 1 ½ and the sun got 2 ¼ How many sugarcanes are these altogether?
5. At Mullisa P. S. $^{2}/_{3}$ of the day is spent on classroom activities, $^{3}/_{12}$ on music and $^{1}/_{8}$ on games. Express these as one fraction.

SUBTRACTION OF FRACTIONS

Example I

½ – $^{1}/_{3}$. LCM of 2 and 3 = 6

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

$= \underline{^{1}/_{6}}$

Example II

$5 - 2^{5}/_{12}$. **Change mixed to improper fraction.**

$= {}^{5}/_{1} - {}^{29}/_{12}$ **LCM of 1 and 12 = 12**

$= \frac{60 - 29}{12}$

$= {}^{31}/_{12}$

Change to mixed fraction.

$= \underline{\mathbf{2^{7}/_{12}}}$

Example III

$2^{2}/_{5} - 1^{1}/_{4}$ **Change mixed to improper fraction**

$= {}^{14}/_{5} - {}^{5}/_{4}$ **LCM of 5 and 4 = 20**

$= \frac{\mathbf{56 - 25}}{20}$

$= {}^{31}/_{20}$ **Change to mixed fraction.**

$= \underline{\mathbf{1^{11}/_{20}}}$

EXERCISE C 10

1. $^{4}/_{5} - {}^{1}/_{5}$
2. $1^{1}/_{10} - {}^{1}/_{2}$

3. $3 - {}^{1}/_{2}$

4. $3^{1}/_{5} - 1^{1}/_{10}$

5. $3^{3}/_{4} - 1^{1}/_{4}$

6. $2^{3}/_{8} - 1^{1}/_{8}$

WORD PROBLEMS INVOLVING SUBTRACTION OF FRACTIONS

Example I

A baby was given $^{5}/_{6}$ litres of milk and drunk $^{7}/_{12}$ litres. How much milk remained?

Given – drunk

$= {}^{5}/_{6} - {}^{7}/_{12}$ **LCM of 6 and 12 = 12**

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

$= {}^{3}/_{12}$. **Reduce to simplest term**.

= **¼ litres**

Example II

2 ½ litres of water were removed from a container of 5 ¼ litres. How much water remained?

Water remaining $= 5\ ¼ - 2\ ½$

$= {}^{21}/_{4} - {}^{5}/_{2}$ **LCM of 4 and 2 = 4**

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

$= {}^{11}/_{4}$. Change to mixed fraction.

= **2 ¾ litres of water remained**.

ADDITION AND SUBTRACTION OF FRACTIONS

Example I

½ $+ {}^{1}/_{3} - ¼$ **LCM of 2, 3 and 4 = 12**

$= \frac{6 + 4 - 3}{12}$ **Add first**

$= \frac{10 - 3}{12}$

$= {}^{7}/_{12}$.

Example II

Work out:

$^{5}/_{6} - {}^{5}/_{9} + {}^{7}/_{18}$ **Collect positive integers first**

$= {}^{5}/_{6} + {}^{7}/_{18} - {}^{5}/$ **LCM of 6, 18 and 9 = 18**

$= \frac{15 + 7 - 10}{18}$ **Add first**

$= \frac{22 - 10}{18}$ **Then subtract**

$= {}^{12}/_{18}$ **Reduce to simplest term**

$= \frac{12 \div 6}{18 \div 6} = \frac{2}{3}$

= **$^{2}/_{3}$**

Example III

Work out: $7^1/_2 - 3^1/_4 + 1^3/_{12}$

$7^1/_2 - 3^1/_4 + 1^3/_{12}$ **Change to improper fraction first.**

$= {}^{15}/_2 - {}^{13}/_4 + {}^{15}/_{12}$ **Collect positive terms**

$= {}^{15}/_2 + {}^{15}/_{12} - {}^{13}/_4$ **LCM of 2, 12 and 4 = 12**

$= \frac{90 + 15 - 39}{12}$ **Add first**

$= \frac{105 - 39}{12}$

$= \frac{66 \div 6}{12 \div 6} = \frac{11}{2}$

$= {}^{11}/_2$ **Change to mixed fraction.**

$=$ **$\underline{5\ ½}$**

EXERCISE C 11

1. $^5/_4 + {}^1/_5 - {}^1/_2$
2. $^2/_3 - {}^5/_6 + ¾$
3. $1^1/_2 + 2^1/_3 - ¼$
4. $2^1/_6 - 3^1/_2 + 5$
5. $5^1/_5 + 1^4/_5 - 3$
6. $^2/_3 + {}^3/_5 - {}^7/_{15}$

MULTIPLICATION OF FRACTIONS

Example I

¼ x 3 **Make 3 a fraction.**

$= ¼ \times {}^3/_1$

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

$=$ **¾**

Example II

$^2/_3$ x 21 **Make 21 a fraction**

$= {}^2/_3 \times {}^{21}/_1$

$= \frac{2 \times \cancel{21}^{7}}{\cancel{3}_{1} \times 1}$

$= \frac{2 \times 7}{1 \times 1}$

$=$ **14**

Example III

½ of 16 **'of' means multiplication**

$= ½ \times 16$ **make 16 a fraction**

Example IV

$2^1/_3$ of 27 **of means multiplication.**

$= 2^1/_3 \times 27$ **make 27 a fraction**

$= ½ \times {}^{16}/_{1}$

$= \frac{1 \times \cancel{16}^{8}}{{}_{1}\cancel{2} \times 1}$

$= 1 \times 8$

1×1

$= \mathbf{\underline{8}}$

$= 2{}^{1}/_{3} \times {}^{27}/_{1}$ **mixed to improper fraction**

$= {}^{7}/_{3} \times {}^{27}/_{1}$

$= \frac{7 \times \cancel{27}^{9}}{{}_{1}\cancel{3} \times 1}$

$= \frac{7 \times 9}{1 \times 1}$

$= \mathbf{\underline{63}}$

EXERCISE C 12

Multiply:

1. ${}^{1}/_{3} \times 3$
2. ${}^{2}/_{3}$ of 15
3. $2{}^{2}/_{5}$ of 20
4. ${}^{1}/_{10} \times {}^{2}/_{9}$
5. ${}^{2}/_{5} \times 10$
6. $1{}^{5}/_{7}$ of 21
7. ${}^{1}/_{2} \times ¼$
8. ${}^{1}/_{8} \times {}^{1}/_{5}$

WORD PROBLEMS INVOLVING MULTIPLICATION OF FRACTIONS

Example I

What is ¼ of 1 hour?

= ¼ of 1 hour

= ¼ of 60 minutes

= ¼ x 60

$= ¼ \times {}^{60}/_{1}.$

$= \frac{1 \times \cancel{60}^{15}}{{}_{1}\cancel{4} \times 1}$

= 1 x 15

= **15 minutes.**

Example II

A mathematics book contains 200 pages. A pupil reads ${}^{3}/_{5}$ of the book. How many pages did the pupil read?

A pupil read ${}^{3}/_{5}$ of 200 pages.

$= {}^{3}/_{5}$ of 200 pages

$= {}^{3}/_{5} \times {}^{200}/_{1}$

$= \frac{3 \times \cancel{200}^{40}}{\cancel{5}_{1} \times 1}$ pages

$= \frac{3 \times 40}{1 \times 1}$ pages

= **120 pages**.

EXERCISE C 13

1. What is ${}^{1}/_{6}$ of 24 kilograms?
2. What is ${}^{1}/_{5}$ of 30 litres?
3. A man received of his salary. If his salary was sh. 20,000, how much money did he receive?
4. Sempa wants to visit his uncle who lives near Kabale town. The journey to Kabale is 40 kilometres away. If his uncle's home is at ${}^{7}/_{8}$ of the journey, how far is it in km?
5. A man had sh. 1,000. He gave away ${}^{2}/_{5}$ of it to his wife. How much money did he give to his wife?
6. Find the area of the rectangle below.



PERCENTAGES

a)Changing percentages to fractions

Example1: What is 25% as a fraction to its lowest terms?

25% = 25/100

= ¼

Work to do: Exercise 7:2 pages 142 MK6

b) Expressing a fraction in percentage form

Example1: Express 4/5 as a percentage

4/5 x 100 = 80/100

= 80%

Work to do: Exercise:7:3 page 143, MK6

c) Changing percentage to decimal

Example: Express 20% as a decimal

20% = 20/100

=2/10

=0.2

Work to do:Exercise 7:5 page 144 MK6

d) Finding the part of the percentage

Example: If 80% of the class are boys, what percentage are girls?

Whole class= 100%

%age of boys= 80%

%age of girls = 100% - 80%

= 20%

Work to do: Exercise 7:8 page146 MK6

e) Expressing quantities as percentage of another quantity

Example1: Kaka had 40 goats.He sold 15 of them. What %age the goats was

i) sold? ii)not sold?

i)fraction sold = 15/40

%age sold = 15/40 x 100

. =37 1/2%

ii)%age not sold

goats not sold = 40 - 15

= 25 goats

fraction unsold = 25/40

%age unsold = (25/40 x 100)%

= 62 ½ %

SOLVING EQUATIONS INVOLVING PERENTAGES

Example 1: If 10% of a number is 40, what is the number?

Let the number be x.

If 10% of the number = 40.

10% of x = 40

10x/100 = 40

10x = 400

x = 40

Example 2: 20% of the pupils in a school are girls. There are 35 girls in he school. How many pupils are there in the school?

$\frac{20}{100} \times X = 35$

$\frac{2}{10}$ of x = 35

$\frac{10}{2} \times \frac{2}{10} = 35 \times \frac{10}{2}$

x = 35 x 5

x = 175 Answer

If 20% of the number = 35.

1% of the number = $\frac{35}{20}$

100% of the number = $\frac{35}{20} \times 100$

= 35 x 5

= 175.

Work to do: More work on Pg 152.

INCREASING QUANTITIES BY PERCENTAGES

Example 1: Increase Sh. 200 by 20%.

(100% + given%) of old number.

First find the increment.

(100% + 20%) of 200.

= $\frac{20}{100} \times 200 = 2 \times 20$

= 120% of 200 = 120 x 200 = 40/-

100

= 12 x 20

= Sh. 240

Then add the increment to the old number.

New amount = (200 + 40)

= 240.

Work to do: More work on Pg 153.

Example 2: The number of pupils in a school last year was 400. This year the number increased by 15%. What is the number of pupils in the school this year?

New number of pupils = (100% + 15%) of old number.

= 115 x 400
100

= 115 x 4 = **460 pupils number of new pupils.**

Exercise on Pg. 154.

DECREASING QUANTITIES BY PERCENTAGES

Example 7: Decrease 300 by 10%.

(100% - 10%) of 300 = 90 x 300 = (10 x 300) = 10 x 3

100 100

= 90 x 3 The decrease = 30

= **270 Answer.** =(300-30) = 270

Example 8: A man's salary is $ 800. How much will his salary be if it is cut by 12 ½ %.

Decrease 800 by 12 ½ % 12 ½ % as a fraction.

12 ½ % as a fraction = (25 x 1) = 25 x 1
200 100 100 100

= 25 = 1 The decrease = (1 x 800

200 8 8

= (8/8 - 1/8) of 800

= 7/8 x 800

= 7 x 100

= **700 Answer**

= 100

The new number = (800-100)

= **700**

Exercise on Pg 155.

FINDING PERCENTAGE PROFIT OR LOSS

Example 9: A trader bought a dress at Sh. 1600 and sold it at Sh. 2000.

a). Find her profit.

Profit = selling price - cost price

= Sh. (2000 – 1600)

= Sh. 400 profit.

b). Find the percentage profit.

Percentage profit = Profit / Cost price x 100%

= 400/1600 x 100%

Profit = 25%

c). Mulema bought a goat at Sh. 35,000 and sold it at sh. 32,000.

i. Find the loss.

Loss = Cost price - Selling price

= Sh. 35,000 - 32,000)

= **Sh. 3,000 Answer.**

ii. What percentage was the loss?

Percentage loss = Loss / Cost price x 100

= 3000/35,000 x 100 = 3 x 100/35 = 60/7 **$8\,^{4}/_{7}$ %**

FINDING SIMPLE INTEREST

Interest = P × R × T where P is principal, R is rate in percentage, T is time

Example: A man deposited 12,000/= in a bank that offers an interest rate of 10% per year. how much interest will he get after 2 years?

Interest = P X R X T

= 12,000 X 10/100 X 2

= 1200 X 2

= 24,000/=

Exercise on page 159 MK6

MORE WORK ON SIMPLE INTEREST

E.G.

a. Calculating the rate (R) when interest , time and principal are given.
b. Calculating the time (T) when interest, principal and rate are given.
c. Calculating Principal (P) when interest rate and time are given.

Reference: MK Pupils book7, page

ADDITION OF DECIMAL FRACTIONS

Example I

Add: 14.9 + 8.02 + 36.48

Arrange vertically and put the decimal point in line

14 . 90
8 . 02
+ 36 . 48
59 . 40

Example II

Add: 0 . 45 + 13 . 2 + 52 . 00

Arrange vertically and put the decimal point in line

0 . 45
13 . 2
+ 52 . 00
65 . 65

EXERCISE C 19

Add the following:

1. 4.96 + 1.7 + 0.36
2. 0.56 + 5.8 + 58.00
3. 0.22 + 2.22 + 22.22
4. 2.7 + 8.92 + 0.37
5. 2.76 + 3.85 + 1.09
6. 65.5 + 4.5 + 20.8

SUBTRACTION OF DECIMALS

Example I

97 .4 – 13 . 69

Arrange vertically and put the decimal points in line

97 . 40
+ 13 . 69
83 . 71

Example II

63 – 19 . 78

Arrange vertically and put the decimal points in line

63 . 00
+ 19 . 78
43 . 22

EXERCISE C 20

Subtract the following:

1. 73 – 19.5
2. 12 – 9.5
3. 57.9 – 3.51
4. 8.54 – 2.34
5. 166 – 66.9
6. 14.9 – 3.5

ADDITION AND SUBTRACTION OF FRACTIONS

Example I

Work out 13.75 – 27 + 91 .25

Collect positive terms first.

= 13.75 + 91.25 – 27 (**First add**)

= 13 . 75

+ 91 . 25

105. 00 (**Then subtract)**

- 27. 00

78. 005.1 – 44.3 + 17.6

1. 8.24 + 22.9 – 7.8
2. 14 – 5.26 + 7.02
3. 6.25 – 4.7 + 3.42
4. 65.6 – 45.9 + 0.36

7.98 – 9.08 + 4.07

SUB TOPIC : **ROUNDING OFF DECIMAL NUMBERS**

Example 1

Round off 0.93 to the nearest whole number

0.93
0
0.9

0.93 0.9

Example 2

Round off1.8 to the nearest whole number

1.8
1
2.0

1.8 2

Example 3

Round off 8.321 to the nearest hundredth

8.321
0
8.320

8. 321 8.32

EXERCISE

A Round off the following to the nearest whole number

1. 1.42
2. 2.36
3. 3.45
4. 3.54

B Round off the following to the nearest tenth

1. 1.32
2. 9.87
3. 5.49
4. 8.758

C Round off the following to the nearest hundredth

1. 12.623
2. 6.829
3. 3.452
4. 7.936

RATIOS AND PROPORTIONS

a) **Expressing Ratios as Fractions**

Example1: Express the ratio 2:3 as a fraction

2 : 3 = 2/3

Work to do: Exercise 6:1,page125,MK pupils Bk6

b) **Expressing fractions as ratios**

Example1: Express 1/3 as a ratio

1/3 = 1 : 3

Work to do: Exercise 6:2 pages 126,MK6

a) Expressing quantities as ratios

Example1: Hala has 12 books and Muna has 20 books. What is the ratio of Hala's books to those of Muna?

Hala's : Muna's

12 : 20

12/4 : 20/4

3 : 4

Work to do: Exercise 6:3 page 127 MK6

b) Solving problems involving ratios

Example1: Mary and John have oranges in the ratio of 2:3 respectively. If Mary has 10 oranges, how many oranges does John have?

Work to do: Exercise 6:4 pages 128, MK6

c) Increasing quantities in a given ratio

Example1:Increase sh.200 in the ratio of 5:4.

Sh (5/4 x 200) = sh. 250

Work to do: Exercise 6:5 page 129, MK6

d) Finding the ratio of increase

Example1: A man's salary was sh 10,000.It has been increased to sh,12,000.In what ratio has it increased?

Increase in ratio = $\frac{\text{new salary}}{\text{old salary}}$

$= \frac{12,000}{10,000}$

=6:5

Work to do: Exercise 6:6 page 130,MK6

e) Decreasing quantities in a given ratio

Example1: Decrease 400 in the ratio of 3:4

400 x ¾ = 100 x 3

= 300

Work to do: Exercise 6:8 page 131,MK6

f) Finding the ratio of decrease:

Example1:The number of pupils in a class has decreased from 40 to 35.In what ratio has the number decreased?

Ratio of decrease = $\frac{\text{new number}}{\text{Old number}}$

=35/40

=7:8

Work to do: Exercise 6:8 page 132, MK6

g) Sharing quantities in ratios

Example1: Share 3600 books between schools A and B in the ratio of 4:5

Total ratio 4+5=9

School A got 4/9 x 3600 = 1600 books

School B got 5/9 x 3600 = 2000 books

Work to do: Exercise 6:9 page 133 MK6

h) Sharing quantities using ratios:

Example1:Share sh 200 between Rona and Kaka in the ratio of 2:3

All parts = 2+3 =5parts

5 arts represent sh 200.

1 part represent sh 200/5

So Rona got sh 200/5 x 2=sh 80

Kaka got sh 200/5 x 3 = sh 120

Work to do: Exercise 6:10 page 134 MK6

k) **Finding the number shared in a given ratio**

Example1: The ratio of male to female in a club is 2:3.If there are 20 males, how many people are in the club altogether?

Work to do: page 135 MK6

DIRECT PROPORTION AND INVERSE PROPORTION

a) Direct Proportion

Example1:One book costs sh.600.What is the cost of 5 similar books?

1 book costs sh. 600

5 books cost (more) sh (600 x 5)

Sh 3000

Work to do: Exercise 6:12 page 136 MK6

Example2: 4 pens cost sh 2000.What is the cost of 7 pens?

4 pens cost sh 2000

1 pen costs sh (2000 ÷ 4)

7 pens cost sh (2000 ÷ 4) x 7

sh (500x7)=sh 3500

b) Inverse Proportion

Example1: 3men can do apiece of work in 6days.How long will 9 men take to do the same piece of work?

3 men take 6 days

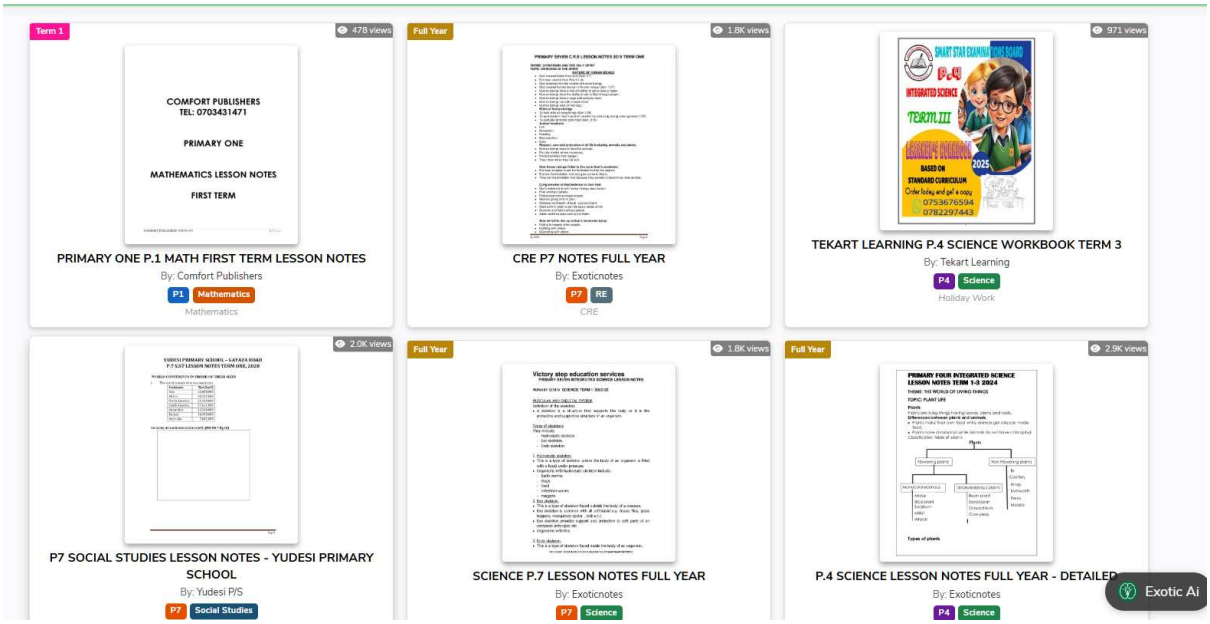
1 man takes (more) (6 x 3) days

9 men take $\frac{(6 \times 3)}{9}$ days

2 days

Work to do: Exercise 6:14 pages 138 - 139, MK6

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