P.4 Maths Lesson Notes - Term I .2014

TOPIC I: SET CONCEPTS.

1. A set is a collection of well-defined objects.
2. Things or objects found in a set are called members or elements.
3. Here are some types of sets and their symbols.

a) Union set (∪)

This is a set of all members of two or more given sets put together.(common members are not repeated) E.g. A={1,2,3,4,5} B={0,2,4,6,8} AUB={0,1,2,3,4,6,8}

b) Intersection set (∩) Joint sets.

This is a set of common members in two or more given sets.

A={1,2,3,4,5} B={0,2,4,6,8} AnB={2,4}

c) Empty sets / null sets ({ } or ∅)

This is a set with no members. E.g. A set of dogs with wings

d) Equal / identical sets (=)

Equal sets have the same number of members which are of the same kind.

e) Equivalent / matching sets (↔)

Equivalent sets have an equal number of members which are of different kind.

A= {a, b, c} B =1, 2, 3} A↔**B**

f) Disjoint sets Non-intersecting.

Disjoint sets are two or more sets which have no common members in them

E.g. A={4,5,6} B={1,2,3} AnB={ }

g) Non-equivalent /un equivalent sets ( )

Non equivalent sets are two sets whose members are not matching.

A = {4, 5, 6,7} B={4,5,6,7,8} A ≠ B

h) Non equal /Unequal sets (≠)

Non equal sets are any sets whose members are not equal.

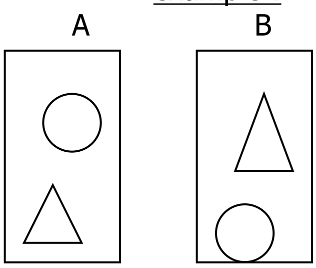
A = {4, ,5, 6,7} B={4,5,6,7,8} A ≠ B

4. Here are some more set symbols.

a) ∈ → is a member of .
b) ∉ → is not an element of .
c) n(B) →the number of members in set B.

EQUAL OR IDENTICAL SETS.

example :



Set A has 2 members.
Set B has 2 members.
Set A and B have the same kind of members.
So set A = set B.

EQUIVALENT / MATCHING SETS.

Example :

Set L= {1, 2, 3, 4, 5}
Set M ={a, b, c, d, e}
Set L has 5 members.
Set M has 5 members.
Set L and set S have different members.
$A \leftrightarrow B$

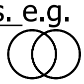
Non-equivalent sets.

Example :
Set E ={ b,o,x}
Set F = {   }
Set E has 3 members.
Set F has no members.
Set E and F are not matching.
So set E and F are non-equivalent sets.
E   F

Reference. A New MK Pri. Maths 2000 bk 4 page 6-8 ; Ex. 1e ,1f

INTERSECTION SETS.

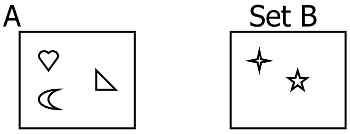
Example : set X = {a, b, c }
Set Y = {a, e, o }
X   Y = {a }
So set X and Y are also joint sets.
Joining sets. e.g.



DISJOINT SETS.

Example.

Set A   Set B

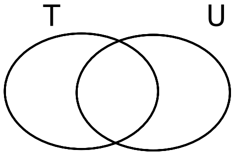


Set A $\cap$ B = { }.
So set A and set B are disjoint sets.
Reference. A New MK Pri. Maths 2000 bk 4 page 9-12; Exercises 1g , 1h.

UNION OF SETS.

Example :   Set T = { o, h, k, f }
Set U= {m, o, r, h, b }
Set T $\cup$ U = { o, h, k, f, m, r, b }.
Filling in members in a Venn diagram.

T   U

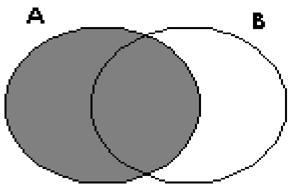


EMPTY SETS

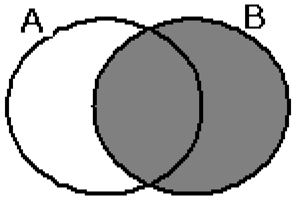
Sets, which don't have members
E.g A set of birds with four legs = { }

SHADING REGIONS ON VENN DIAGRAMS.

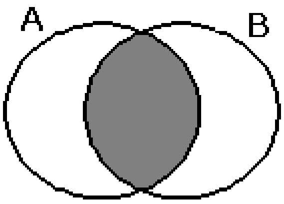
1. **Set A**



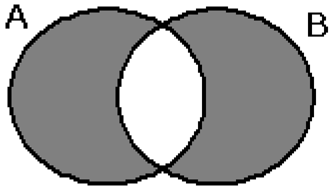
Set B



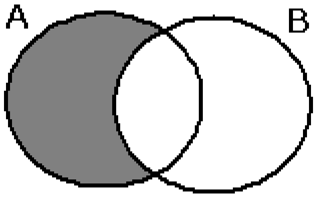
3. **A∩B**



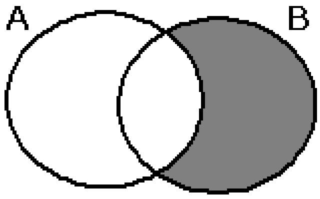
4. **A∪B**



5. **A – B**

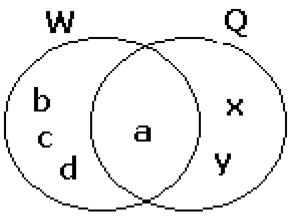


6. **B – A**



USING VENN DIAGRAMS TO SOLVE SET PROBLEMS.

Example.



Set W = {a, b, c, d }
Set Q = {a, x, y }
Set W ∩ Q = {a }
Set W ∪ Q = {a, b, c, d, x, y }
Set W – Q = {b, c, d }
Set Q – W = { x, y }
Set Q = { a, x, y }
∴ n(Q) = 3 members.

Reference. A New MK Pri. Maths 2000 bk 4 page 13-18.

TOPIC 2: NUMERATION SYSTEMS AND PLACEVALUE.

Representing whole numbers on an abacus.

For example : Represent 12351 on an abacus.

Tth Th H T O

1 2 3 5 1

Writing place values of numbers.

Example : What is the place value of 4 in the number 14300 ?

Tth Th H T O
1 4 3 0 0
Thousands

The place value of 4 in 14300 is Thousands.

Finding values of numbers.

Example : Find the value of 5 in the number 350.

H T O
3 5 0
5 x 10 = 50

The value of 5 in 350 is 50.

Finding total values of numbers.

Example: (a)Find the total value of 7 and 3 in the number 1793.

Th H T O
1 7 9 3
700 + 3 = 703.

$\therefore$ the total value of 7 and 3 in 1793 is 703 Ans.

(b) Find the total values of these numbers:

7 Thousands + 2 Hundreds.
(7 x 1000) + (2 x 100) = 7000 + 200.
= 7200 Ans.

Finding products of values.

Example : Work out.

(a) 2 Tens x 3.
2 x 10 x3 = 6 x 10.
= 60 Ans.

(b) 4 Hundreds x 2.
4 x 100 x 2 = 8 x 100.
= 800 Ans.

Expanded forms of whole numbers.

Using values to expand numbers.

e.g. 13504 = (1 x 1000) + (3 x 1000) + (5 x 100) + (4 x 1).
= 10000 + 3000 + 500 + 4 Ans.

Finding the expanded numbers.

e.g. 700 + 70 + 7 = 700
70
+ 7
7 7 7 *Ans.*

Writing figures in words.

Example :

Write in words : 20841

20841→ 20000 = twenty thousand.
800 = eight hundred.
41 = forty one.

∴ 20841 = twenty thousand eight hundred forty one.

Writing number words in figures.

Example. Write in figures: twelve thousand six hundred thirty two.

Twelve thousand = 12000
Six hundred = 600
Thirty two = 32
12632

∴Twelve thousand six hundred thirty two = 12632 Ans.

Reference. A New MK Pri. Maths 2000 bk 4 page 18-25.

Place values of whole and decimal numbers.

Example : Write down the place value of each digit in the number below.

2 4 3 5 2 . 1
tenths
Ones
Tens
Hundreds
Thousands
Ten thousands

Finding values of decimal numbers.

Example : Find the value of 3 in the number 24.3

three tenths

∴The value of 3 in 24.3 is three tenths(0.3)

Comparison of decimals using

- Using a number line
-Using symbols < or >

Values of wholes and decimals

H T O Th
3 4 5. 6
(3x100)+(4x10)+(5x1)+(6x $^1/_{10}$)
300+40+5+0.6

Writing decimal numbers in words.

Example : 3.7→ 3.0 =three
+0.7 = seven tenths.
3.7 = three and seven tenths

Writing decimal number words in figures.

Example : Write Twenty five and three tenths in figures.

Twenty five = 25.0
Three tenths = + 0.3
25.3 Ans.

Reference. A New MK Pri. Maths 2000 bk 4 page 26-30.

USING ROMAN NUMERATION SYSTEM.

1. A number is an idea of quantity.
2. A numeral is a symbol representing a number e.g. 4, 9, as in Hindu Arabic numerals or IV, IX, as

in Roman numerals.

3. The commonest numeration system used in the world today is the Hindu Arabic system with numerals like: 1, 2, 3, 4, 5, 6, 7, 8, …

ROMAN NUMERALS.

Here are some key Roman numerals from 1-100.

I =I , 5 = V , 10 = X , 50 = L , 100 = C .

The Roman numerals got by repeating I or X

2 = 1 + 1 3 = 1 + 1 + 1. 20 = 10 + 10 + 10. 30 = 10 + 10 + 10.

2 = I + I. 3 = I + I + I. 20 = X + X. `30 = X + X + X.

∴2 = II Ans. ∴3 = III Ans. ∴20 = XX Ans. ∴30 = XXX Ans.

The Roman numerals got to adding 5.

6 = 5 + 1 7 = 5 + 2. 8 = 5 + 3.

= V + I. = V + II. = V + III.

∴6 = VI Ans. ∴7 = VII Ans. ∴8 = VIII Ans.

The Roman numerals got by subtracting from 5, 50 or 100.

4 = 1 subtracted from 5. 40 = 10 subtracted from 50. 90 = 10 subtracted from 100.

= 5 - 1. = 50 – 10. = 100 – 10.

= V – I. = L – X. = C – X.

∴4 = IV Ans. ∴ 40 = XL Ans. ∴ 90 = XC Ans.

Note. When subtraction is involved, Roman numerals with bigger values appear before the less values.

Changing Hindu Arabic numerals into Roman numerals.

Example : i) 14 = 10 + 4. ii) 40 = 50 –10.

= X + IV. = L – X.

∴14 = XIV Ans. ∴40 = XL Ans.

Changing Roman numerals into Hindu Arabic numerals.

Example : i) XXVI = XX + VI. ii) XC = C – X.

XX = 20 C = 100.

VI = + 6 X = -10

∴XXVI = 26 Ans. XC = 90 Ans.

Word problems in Roman numerals and Hindu Arabic numerals.

Example : i) Mary has 11 goats. How many goats are those in Roman numerals?

Mary has 11 goats.

11 = (10 + 1) goats.

= (X + I) goats.

= XI goats.

Reference. A New MK Pri. Maths 2000 bk 4 page 31-34.

TOPIC :3 OPERATION ON NUMBERS.

ADDITION OF NUMBERS.

a) Without regrouping. With regrouping. c) With decimal numbers.

Example: 7464 example : 6151 Example : 240.3

\+ 4425 +9879 +25.0

11889 Ans. 16030 Ans. 265.3 Ans

Word problems in addition.

Some words in sentences mean add e.g. add, plus, total, increase, more, greater etc.

Example : A boy counted 268 cars on Monday and 454 cars on Tuesday. How many cars did he count altogether?

Mon. 268 cars.
Tue. 454 cars.
722 cars

∴ he counted 722 cars.

Reference. A New MK Pri. Maths 2000 bk 4 page 38-41.
Understanding Maths bk 4 page 30-34.

SUBTRACTION OF NUMBERS.

Some words in sentences mean subtract e.g. subtract, minus, difference, reduce, decrease, less, change, remainder, balance etc.

a) Without regrouping. b) With regrouping. c)With decimals.

Example : 346 10264 40.4

-25 -3114 - 2.3

321 Ans. 7150 Ans. 38.1 Ans.

Word problems in subtraction.

Example : Juma had shs. 6300. He used shs. 5600 to buy a toy car. How much money was he left with?

Juma had shs. 6300.
He spent - shs.5600.
Remainder = shs 700 .

∴ He was left with shs. 700 Ans.

MULTIPLICATION OF NUMBERS.

Using repeated addition.

Example : 4 x 4 means add four groups of 4.

∴4 x 4 = OOOO + OOOO + OOOO + OOOO.

Multiplying digits up to 4 digits by one digit.

Example : a) 32 b) 507 c) 2860
x 3 x 5 x 4
96 Ans. 2535 Ans. 11440 Ans.

Multiplication through factor 10.

Example : a) 145 x 10 = 1450 x 1.
= 1450 Ans.

b) 57 x 200 = 5700 x 2.
= 5700
x 2
11400 Ans.

Multiplying two by two digit numbers.

a) 21
x13
63
\+ 210
273 Ans.

side work
(21 x 3) + (21 x 10).
63 + 210.

b) 15
x 24
60
\+ 300
360 Ans.

side work.
(15 x 4) + (15 x 20)
60 + (150 x 2).
60 + 300.

Word problems in multiplication.

Example :

A carton of tomatoes weighs 45 kg. Mother sold 5 cartons full of tomatoes. How many kg of tomatoes did she sell?

1 carton weighs 45 kg.

(5 cartons weigh more than 45 kg).

$$\begin{array}{r} 45 \\ \times\ 5 \\ \hline 225 \end{array} \text{ kg.}$$

.

$\therefore$ 5 cartons of tomatoes weigh 225 kg Ans.

DIVISION OF NUMBERS.

Using repeated subtraction.

Example : $7 \div 2 \rightarrow 7 - 2 = 5$. ($1^{st}$ time)

$5 - 2 = 3$ (2^{nd} time)

$3 - 2 = 1$ (3^{rd} time)

rem 1

There are 3 groups remainder 1 .

$\therefore$ $7 \div 2 = 3$ rem. 1 Ans.

Simple division across.

Example : $12 \div 4 = 3$ Ans; $60 \div 6 = 10$ Ans; $72 \div 8 = 9$ Ans.

Using long division.

a) Without remainders.

Example :

$$\begin{array}{r} 6 \text{ Ans.} \\ 4\ \ 24 \\ -24 \\ \hline 0 \end{array}$$

b) With remainders.

Example :

$$\begin{array}{r} 124 \text{ Ans.} \\ 5 \,\big|\, 620 \\ 5\downarrow \\ \hline 12 \\ -\ 10\downarrow \\ \hline 20 \\ -\ 20 \\ \hline 0 \end{array}$$

Division through factor 10.

Example : a) $4000 \div 100 = 40 \div 1$.

$= 40$ Ans.

b) $630 \div 70 = 63 \div 7$.

$= 9$ Ans.

Word problems in division.

Example : I shared 1450 shillings equally among 5 boys. How much money did each boy get?

5 boys shared 1450 shillings.

(each boy got less than 1450 shillings).

$$\begin{array}{r} 290 \text{ shillings} \\ 5\ \ 1450 \\ -\ 10 \\ \hline 45 \\ -45 \\ \hline \end{array}$$

$\therefore$

$\therefore$ Each boy got 290 shillings Ans.

TOPIC 4:NUMBER PTTERNS AND SEQUENCES.

TYPES OF NUMBERS.

1. **Whole numbers.** These are made up of the set of counting numbers together with zero. A set of whole numbers, W={0,1,2,3,4,….}
2. **Counting numbers / natural numbers** show quantity e.g. A set of counting numbers, N={1, 2, 3, 4, 5, 6, …}
3. **Ordinal numbers** show positions e.g. 1^{st}, 2^{nd}, 3^{rd}, 4^{th}, …
4. **Even numbers** are divisible by two exactly e.g. 0, 2, 4, 6, 8, 10, …
5. **Odd numbers** are divisible by two but with one remainder e.g. 1, 3, 5, 7, 9, …
6. **Cardinal numbers** .These numbers show quantity e. g 1,2,3,4,…

NUMBER SEQUENCES.,

In a sequence of numbers , there must be a common pattern that relates them.

E.g 1,3,5,7,9,….

V V VV

+2 +2 +2

FACTORS OF NUMBERS.

Finding factors of given numbers.

Example : Find all factors of 24.

Working

F_{24} are : 1 x 24 = 24
2 x 12 = 24
3 x 8 = 24
4 x 6 = 24

$\therefore$ F_{24} = {1, 2, 3, 4, 6, 8, 12, 24 } Ans.

Finding the greatest common factors of given numbers.

Example : Find the GCF of 12 and 24.

MULTIPLES OF NUMBERS.

A multiple is a product of two factors.

E.g.

Multiples of 2 are 1 x 2 = 2
2 x 2 = 4
3 x 2 = 6

M_2 = { 2, 4, 6, 8, …}

Lowest common multiples.

E.g

Find the L.C.M. of 5 and 3.

M_3 = { 3,6,9,12,15,18}…

M_5 = { 5,10,15,20,25}…

Common multiples ={ 15,…}

L.C.M. of 5 and 3 is 15.

Reference: MK Primary Maths 2000 Bk 4 page 59-57.

P.4 Mathematics lesson notes Term II 2014

NUMBER PATTERNS AND SEQUENCES.
NOTE: First identify the common pattern that relates the numbers.

[Include all the operations in the examples and exercise]

a). Find the next number in the sequence. 1, 3, 5, 7, 9, 11, 13…

b). Find the next number in the sequence. 1, 2, 4, 7, 11, 16…

c). Find the next number in the sequence. 16, 12, 8, 4, ….

d). Find the next number in the sequence. 1,2,4,8,16…

e). Find the next number in the sequence. 27, 9, 3…

f). Find the next number in the sequence. 1,3,9,27…

NOTE: Each sequence comes with its pattern.
Exercise
Find the missing numbers in the patterns.
1. 5,10,..,20,25,….,35.
2. 0,1,3,4,6,7,9,, …… ……
3. 2,2,3,5,8…23,30.
4. 4,6,8,9,10,12…15…18.
5. 5,9,8,12,11,15,14…
6. 3,9,27…
7. 48,24,12,6…
8. 100,90, 80,70…

[Check MK pgs 62 & 63]

FACTORS / DIVISORS.

A factor is a number, which divides into another exactly and leaves no remainder.
Example:
Give pairs of numbers you multiply to get 6.

$6\div1=6$ OR $1\times6=6$

$6\div2=3$ $2\times3=6$

$6\div3=2$ $3\times2=6$

$6\div6=1$ $6\times1=6$

All numbers, which can divide 6 exactly leaving no remainder, are factors of 6
$\therefore F_6 = \{1,2,3,6\}$

Example II

Give all factors of 12 and say how many there are:
F_{12} are: $12 \div 1 = 12$ because $1 \times 12 = 12$
$12 \div 2 = 6$ $2 \times 6 = 12$
$12 \div 3 = 4$ $3 \times 4 = 12$
$12 \div 4 = 3$ $4 \times 3 = 12$
$12 \div 6 = 2$ $6 \times 2 = 12$
$12 \div 12 = 1$ $12 \times 1 = 12$

$\therefore$ F12 = {1, 2, 3, 4, 6, 12}.
12 has 6 factors.

Example III

Give all the factors of 25 and count them
$25\div1=25$ because $1 \times 25 = 25$
$25\div5=5$ $5 \times 5 = 25$
$25\div25=1$ $25 \times 1 = 25$
$\therefore F_{25} = \{1, 5, 25\}$.
25 has 3 factors.

- Check MK pgs73

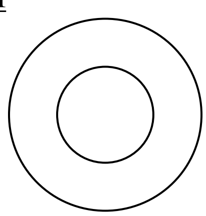
USING TABLES.

Factors	Multiples
1 X 10=	10
2 X 5 =	10
5 X 2 =	10
10 X 1=	10

All numbers, which we can multiply together to get 10, are factors of 10
$\therefore$F10 {1, 2, 5, 10}
[MK PAGE 74]

Example II

Factors of 12



$\therefore F_{12}$ = {1,2,3,4,6,12}, {look at Pg73-76}

THE GREATEST COMMON FACTOR (GCF)

Examples

1. Find the common factors of 6 and 12.

F6	F12
6 ÷ 1 = 6	12 ÷ 1 = 12
6 ÷ 2 = 3	12 ÷ 2 = 6
6 ÷ 3 = 2	12 ÷ 3 = 4
6 ÷ 6 = 1	12 ÷ 4 = 3
	12 ÷ 6 = 2
	12 ÷ 12 = 1
F6. ={1,2,3,6}.	F12 ={1,2,3,4,6,12}

Common factors of 6 and 12 ={1,2, 3,6}

ii. Find the GCF of 6 and 12

Their GCF is 6

MULTIPLES.

A multiple is a product of two whole numbers.

Example

Find multiples of 4 less than 17.

1 x 4 = 4
2 x 4 = 8
3 x 4 =12
4 x 4 =16

$\therefore M_4$ = { 4,8,12,16}.

A. List the first 12 multiples of the following:

2. M_2 = 1 x 2 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
2 x 7 = 14
2 x 8 = 16
2 x 9 = 18
2 x 10 = 20
2 x 11 = 22
2 x 12 = 24

$\therefore$ The first12 multiples of 2 are
M_2 = {2,4,6,8,10,12,14,16,18,20,22,24}

Listing multiples of the following:

i) Multiples of 2 less than 10.
M_2 are 1 x 2 = 2
2 x 2 = 4
3 x 2 = 6
4 x 2 = 8
5 x 2 = 10

$\therefore M_2$ less than 10 are {2,4,6,8}.

2) Multiples of 9 between 20 and 60.

M_9 are 1 x 9 = 9
2 x 9 = 18
3 x 9 = 27
4 x 9 = 36
5 x 9 = 45
6 x 9 = 54
7 x 9 = 63
8 x 9 = 72

$\therefore M_9$ between 20 and 60 are {27,36,45,54} [page65-66]

COMMON MULTIPLES [page67]

Example.

Find the common multiples of 3 and 6.

M_3 = {3, 6, 9, 12, 15, 18, 21, 24..}
M_6 = { 6, 12, 18, 24, 30, 36..........}

Common multiples of 3 and 6 = { 6, 12, 18 ......}

LOWEST COMMON MULTIPLES (LCM)

Find the LCM of 3 and 4.

M_3 = {3,6,9,12, 15, 18, 24,..........}

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

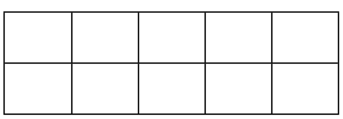
Common multiples of 3 and 4 = {12, 24...} The LCM of 3 and 4 = 12.

FRACTIONS.

A fraction is a part of a whole.

* [Some diagrams to illustrate fractions are needed]

Meaning of a fraction.



2 parts out of 10 parts are shaded,
Therefore, the fraction of the shaded part is $\frac{2}{10}$

Names and parts of fractions.

1] Numerator
2] Denominator

$\frac{1}{2}$ = one half, $\frac{2}{3}$ = two thirds

Read the following fractions

[I] $\frac{2}{4}$ = Two quarters [iii] $\frac{3}{10}$ = Three tenths

[ii] $\frac{2}{7}$ =Two sevenths [iv] $\frac{2}{6}$ =two sixths

Types of fractions. `

a) Proper fractions.

A Proper fraction is a fraction whose numerator is less than its denominator

Examples $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$, $\frac{5}{7}$, $\frac{2}{5}$

* Note: A proper fraction is always less than one

b) Improper fractions.

It is a fraction whose numerator is greater than its denominator.

* An improper fraction is greater than 1.

Examples

$\frac{8}{5}$, $\frac{5}{4}$, $\frac{6}{5}$, $\frac{9}{7}$

d**) Mixed numbers**

It is a number made up of whole number and a proper fraction

It has two parts (1) Whole number

(11). Proper fraction

E.g. 1½, $5^{2}/_{3}$

e) Changing **mixed fractions into improper fractions**.

Example.

Change $1\frac{1}{4}$ into an improper fraction.

$$1\frac{1}{4} = \frac{(D \times W) + N}{D}$$

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

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

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

Note: N = numerator

D = denominator

W = whole number

f) **Changing improper fractions into mixed fractions.**

E.g. change 9/4 into an improper fraction.

$$\frac{9}{4} = 9 \div 4$$

$$= 2 \text{ rem } 1$$

$$\therefore \frac{9}{4} = 2\frac{1}{4}$$

Note: The answer becomes the whole number, the remainder is the numerator and the denominator remains as the denominator.

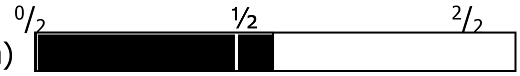
REF: Understanding Moths Bk 4 Pp 54 – 60.

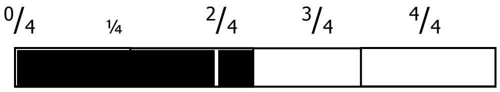
MK Pri. Moths Bk 4 pp 85.

EQUIVALENT FRACTIONS.

Study the following diagrams

(Equivalent fractions with different names but with equal value).

a) 

b) 

A and Bare called equivalent fractions. The shaded parts are equal but have been divided into different parts.

$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$ **Fill in the missing equivalent fractions.**

$\frac{1}{3} = \frac{2}{6} = \frac{3}{9} =$

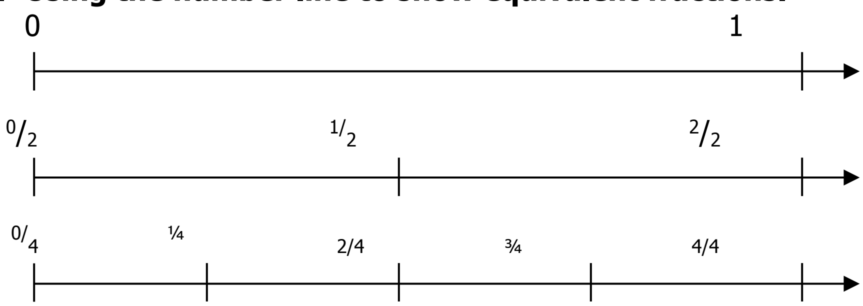
Note: Equivalent fractions can be obtained by either division or multiplication

Eg.Write the next two equivalent fractions

$\frac{2}{3}$, $\frac{2 \times 2}{3 \times 2} = \frac{4}{6}$, $\frac{2 \times 3}{3 \times 3} = \frac{6}{9}$

$\frac{2}{3} = \frac{4}{6} = \frac{6}{9}$ (they are equivalent fractions

B. Using the number line to show equivalent fractions.



Note: All the equivalent fractions will fall in the same line or point on the different number lines.

e.g. $\frac{1}{2} = \frac{2}{4} = \frac{3}{6}$

C. Multiplying numerator and denominator by the same whole number greater than 1.

Example.

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

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

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

$\therefore$Fractions equivalent to ½ = 2/4 =3/6 = 4/8

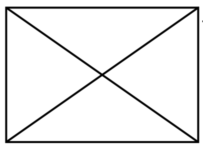
Example. Find three equivalent fractions of 18

$\frac{18}{36}$, $\qquad \frac{18 \div 2}{36 \div 2} = \frac{9}{18}$, $\qquad \frac{9 \div 3}{18 \div 3} = \frac{3}{6}$, $\qquad \frac{3 \div 3}{6 \div 3} = \frac{1}{2}$

$\frac{18}{36} = \frac{9}{18} = \frac{3}{6} = \frac{1}{2}$

Shading equivalent fractions on diagrams.

Shade 1/2 of this shape.



Side work

½ of 4 $= \frac{1}{2} \times 4$

$= 4 \div 2$

= 2 parts.

½ = $^2/_4$

Finding the missing numbers.

Example.

i) $^2/_3 = /_6$ side work

$6 \div 3 = 2$

Multiply $^2/_3$ by 2

$^2/_3 \times {^2/_2} = {^4/_6}$

$\therefore \frac{2}{3} = \frac{4}{6}$

i) $^2/_3 = {^{4}/}$ side work

$4 \div 2 = 2$

Multiply $^2/_3$ by 2

$^2/_3 \times {^2/_2} = {^4/_6}$

$\therefore \frac{2}{3} = \frac{4}{6}$

REF: MK Pri. Mtc BK 4 Pp 80- 82

Understanding Mtc BK 4 Pp 61 – 65.

REDUCING FRACTIONS TO THEIR LOWEST TERMS.

1.Find the lowest common factor of the numerator and the denominator.

2.Divide the denominator and the numerator by their lowest common factor.

3.Write the reduced fraction.

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

$F_3 = (1, 3)$

$F_6 = (1, 2, 3, 6)$

Common factors (1, 3)

HCF=3

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

c) When there is no whole number which can exactly divide the numerator and denominator, then the fraction is in its lowest terms.

d) COMPARISON OF FRACTIONS.

Examples.

1.Fill in the gaps using > < or = (> **greater than,** < **less than, =equal)**

a) $\frac{1}{3}$ _ $\frac{3}{6}$

Use equivalent fractions only. Multiply until the denominators are the same and thereafter compare the numerators.

$\frac{1}{3}$ $\quad \frac{1 \times 2}{3 \times 2} = \frac{2}{6}$, $\quad \frac{1 \times 3}{3 \times 3} = \frac{3}{9}$, $\quad \frac{1 \times 4}{3 \times 4} = \frac{4}{12}$

$\frac{3}{6}$ $\quad \frac{3 \times 2}{6 \times 2} = \frac{6}{12}$, $\quad \frac{3 \times 3}{6 \times 3} = \frac{9}{18}$, $\quad \frac{3 \times 4}{6 \times 4} = \frac{12}{24}$,

Compare $\frac{4}{12}$ and $\frac{6}{12}$ Now 6 is greater than 4 therefore $\frac{1}{3} < \frac{3}{6}$

b) **Arrange these fractions in ascending order.**

(Use equivalent fractions only)

Ascending order means to arrange from smallest to largest

Example $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{8}$.

$\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16}$

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

$\frac{1}{8} = \frac{2}{16} = \frac{3}{24} = \frac{4}{32}$ (Look at fractions whose denominators are 8 and compare the value of their numerators)

Order becomes $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$

Arrange these fractions in a descending order (from largest to smallest).

Example. $\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{8}$.

$\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16}$

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

$\frac{1}{8} = \frac{2}{16} = \frac{3}{24} = \frac{4}{32}$

(Look at fractions whose denominators are the same and compare the value of their numerators)

Order becomes $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$

ADDITION OF FRACTIONS.

a) Addition of fractions with the same denominators.

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

$\quad 5 \quad 5 \qquad 5$ (Add numerators only if the denominators are the same)

$= \frac{3}{5}$

b) word problems on addition fractions with the same denominators

Jane ate $\frac{2}{6}$ of her bread in the morning and $\frac{3}{6}$ in the evening what fraction did she remain with?

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

$= \frac{5}{6}$

C) Addition of mixed numbers

$2\frac{1}{5} + 1\frac{3}{5}$ (Add whole numbers together and fractions together)

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

$=3+\frac{1+3}{5}$

$=3+\frac{4}{5}$

$=\mathbf{3}\frac{4}{5}$

D) word problems on addition of mixed numbers with the same denominators

Daniel was given $\mathbf{2}\frac{3}{8}$ of a loaf of bread in the morning and $\mathbf{4}\frac{2}{8}$ of a loaf of bread in the evening, how many loaves of bread was he given?

$\mathbf{2}\frac{3}{8} + \mathbf{4}\frac{2}{8} = (2 + 4) + \frac{3}{8} + \frac{2}{8}$

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

$=6 + \frac{5}{8}$

$=\mathbf{6}\frac{5}{\mathbf{8}}$ loaves of bread

E) Addition of fractions with different denominators

- Example

Add $\frac{1}{3} + \frac{2}{6} = \frac{(1 \times 6)}{(3 \times 6)} + \frac{(2 \times 3)}{(6 \times 3)}$

$= \frac{6}{18} + \frac{6}{18}$

1

$= \frac{12}{18}$ (GCF IS 6)

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

$= \frac{2}{3}$

SUBTRACTION OF FRACTIONS.

a) Subtraction of fractions with the same denominators

Example I. $\frac{2}{3} - \frac{1}{3} = \frac{2 - 1}{3}$

$= \frac{1}{3}$

b) subtraction of fractions from a whole

Example ii

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

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

$= \frac{3}{5}$

c) Word problems on subtraction of fractions with the same denominators

Andrew had $\frac{7}{9}$ of a cake, he ate $\frac{5}{9}$ of it what fraction remained?

$\frac{7}{9} - \frac{5}{9} = \frac{7 - 5}{9}$

$= \frac{2}{9}$

D) Subtraction of mixed numbers with the same denominators.

$4\frac{3}{5} - 2\frac{1}{5} = (4 + \frac{3}{5}) - (2 + \frac{1}{5})$

$= (4 - 2) + \frac{(3 - 1)}{5}$

$= 2 + \frac{2}{5}$

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

E) Subtraction of fractions with different denominators

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

$= \frac{4 - 3}{6}$

$= \frac{1}{6}$

Multiplication of fractions by whole numbers

Example:

1 What is $\underline{1}$ of 8 ?

$$\frac{1}{2} \text{ of } 8 = \frac{1}{2} \times 8$$

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

$$= \frac{\cancel{8}^{4}}{\cancel{2}} \quad \text{OR } (8 \div 2 = 4)$$

$$= \underline{4}$$

DECIMAL FRACTIONS

Refer to place values of decimal numbers

Writing decimals in words

(1) 0.2 = 0 . 2 (Two tenths)

0 → Ones, 2 → Tenths

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

(ii) 2.3 = 2 . 3

2 → Ones, 3 → Tenths

$$= 2 + 0.3$$

$$= 2 + \frac{3}{10}$$

$$= \mathbf{2\frac{3}{10}}$$

Changing fractions to decimals

Example

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

$$= 2\overline{)\,1\,}\quad 0.5$$

0×2 = - 0
1.0

0.5×2= - 1.0
0 0

$\frac{1}{2} = 0.5$

Addition of decimal fractions

(1) Examples

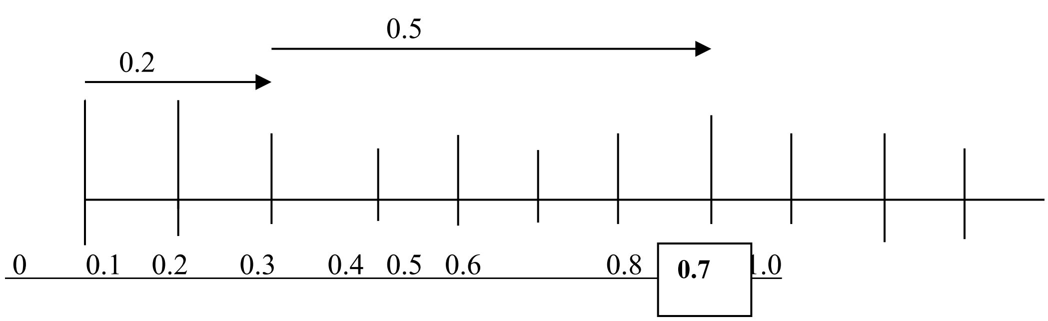
0.3 + 0.4 = 0 . 3
+ 0. 4
0. 7

(11) 5 + 0.6 = 5 . 0
+ 0 . 6
5. 6

Addition of decimals using a number line

Examples

0.2 + 0.5



0.2 + 0.5 = 0.7

Word problems on addition of decimals

Example

I ate 0.2 of a cake in the morning. And 0.7 of it in the evening. What decimal fraction did I eat altogether?

0.2 + 0.7 = 0 . 2
+ 0 . 7
0 . 9

Subtraction of decimals

Examples

(i) 4 . 5 - 2 . 3 = 4 . 5

(ii) 9 .6 - 3 . 7 = 8 . 16
$\cancel{9}$. $\cancel{6}$
- 3 . 7

- 2 . 3 5 . 9
2 . 2

Word problems on subtraction of decimals

Mbabazi had 3 . 5 metres of cloth. She cut off 1. 8 metres. What length of cloth was left?

$$3.5 - 1.8 = \begin{array}{r} {\scriptstyle 2}\ \ {\scriptstyle 15} \\ \cancel{3}\ .\ \cancel{5} \\ \underline{1\ .\ 8} \\ \underline{\mathbf{1\ .\ 7}} \end{array}$$

Ordering decimal fractions

Arrange 0 . 7, 0 . 3, 0 . 5, starting the smallest
(Change decimals to common fractions)

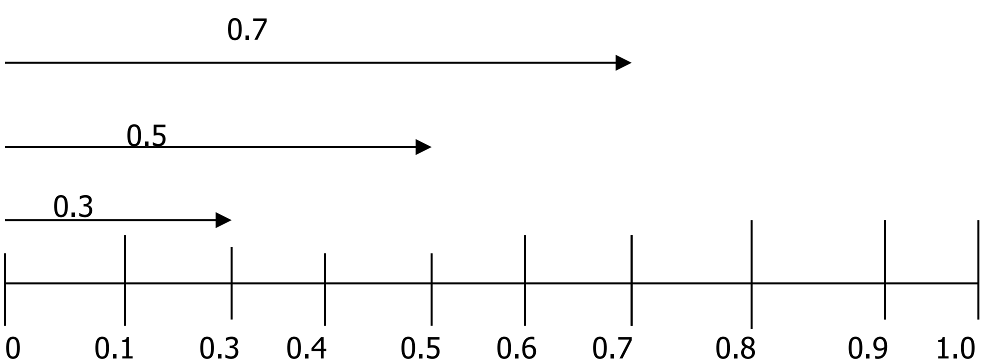
0.7, 0.3, 0.5,

$0.7 = \frac{7}{10}$, | $0.3 = \frac{3}{10}$, | $0.5 = \frac{5}{10}$ (order numerators)

Order = 0.3 , 0 . 5 , 0 . 7

OR

0.7, 0.3, 0.5



Order = 0.3, 0.5, 0.7

ALGEBRA.

Using letters in place of boxes.

A. **ADDITION.**

Example: m + 4 =14

Possible questions:

i) What number do you add to 4 to get 14?

ii) I think of a number, when I add it to 4 the answer is 14. Find the number.

Solution

m + 4 = 14

m + 4 – 4 = 14 – 4.

$m + 0 = 10.$

$m = 10$ An

Prove

$m + 4 = 14.$

$10 + 4 = 14.$

$14 = 14.$

B. **SUBTRACTION.**

Example:

$k - 3 = 12$

Possible questions.

i) When I subtract 3 from a certain number, the result is 12. What is the number?

ii) I think of a number, when I subtract 3 from it, the answer is 12. Find the number.

Solution.

$k - 3 = 12.$

$k - 3 + 3 = 12 + 3.$

$k - 0 = 15.$

$k = 15$ Ans.

Prove

$k - 3 = 12$

$15 - 3 = 12.$

$12 = 12.$

C. **MULTIPLICATION.**

Example:

i) $3 \times a = 3a.$

$3 \times a = 3$ groups of a

$3 \times a = a + a + a.$

$= 3a$ Ans.

ii) $8 \times q = 24$

Possible questions.

a) What number do I multiply by 8 to give 24?

b) I think of a number, when I multiply it by 8 the answer is 24. Find the number.

Solution.

$8 \times q = 24$

$\frac{8q}{8} = \frac{24}{8}$

$q = 24 \div 8$

$q = 3$ An

Prove

$8 \times q = 24.$

$8 \times 3 = 24.$

$24 = 24.$

WORD PROBLEMS INVOLVING MULTIPLICATION.

Example.

1 pen costs y shillings. How much money do 5 such pens cost?

Solution.

1 pen costs y shillings

5 pens cost 5 x y shillings.

= 5y shillings.

C) **DIVISION**

Example:

$p \div 3 = 9.$

Possible questions.

When I share a number among 3, the answer is 9. Find the number.

I think of a number, when I divide it by 3 the answer is 9. What is the number?

Solution:

$P \div 3 = 9.$

$P \div 3 \times 3 = 9 \times 3.$

$P = 27$ Ans.

Prove

$P \div 3 = 9$

$27 \div 3 = 9.$

$9 = 9.$

REFERENCE.

MK Primary Maths book 4 page 246 – 254.

D) **FORMING EQUATIONS.**

Example.

Mary has some goats. When she sells 5 of them, she remains with 9 goats. How many goats did she have?

Solution:

Let the number of goats be g.

Equation

$g - 5 = 9$ goats.

$g - 5 + 5 = 9 + 5$ goats.

$g + 0 = 14$ goats.

She had 14 goats.

REFERENCE.

MK Primary Moths Bk 4 page 257 –261

E) **SUBSTITUTION.**

Replacing given letters with directed numbers.

Example.

If g = 4 , find the value of 4g.

4g = 4 x g.

= 4 x 4.

= 16 Ans.

If a = 2; b = 3; c = 4, find the value of a + b – c.

a + b – c = 2 + 3 – 4

= 5 – 4

= 1 Ans.

REFERENCE.

MK Primary Maths book 4 page 253 –254.

F) **COLLECTING LIKE TERMS.**

Like terms.

Example

7pens + 3pens + 2pens = 12 pens.

Using letters

7p + 3p + 2p = 12p.

Unlike terms.

Example

3tins + 5balls + 1tin = 3tins + 1tin + 5balls.

= 4tins + 5balls.

Using letters.

2k + 6m + k + 2m = 2k + k + 6m + 2m

= 3k + 8m Ans.

REFERENCE.

MK Primary Maths book 4 page 249 – 252.

GEOMETRY.

Polygons.

- Poly = many
- A polygon is a flat closed shape with many sides and angle.
- The sides of a polygon are line segments.

- Polygons are named according to their number of sides.

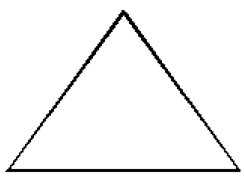
Number of sides	Name of the polygon
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon / septagon
8	Octagon
9	Nonagon
10	Decagon

- In polygons, the prefix tells how many sides the polygon has.

Example : Tri means three,
Quad means four
Penta means five
Etc

a) <u>Triangles</u>

i) Equilateral triangle has all the three sides and angles equal.



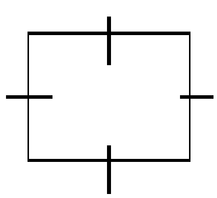
<u>Properties of triangles</u>

i) It has 3 sides
ii) It has three angles
iii) It has three vertices /corners

b)**<u>Quadrilaterals</u>**

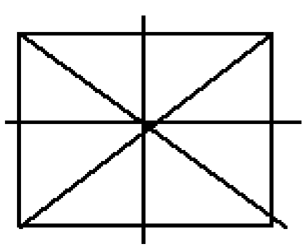
- A quadrilateral is a polygon having four sides.
- Examples of quadrilaterals are
  a) Square
  b) Rectangle
  c) Kite
  d) Trapezium
  e) Rhombus
  f) Parallelogram

<u>C)Square</u>



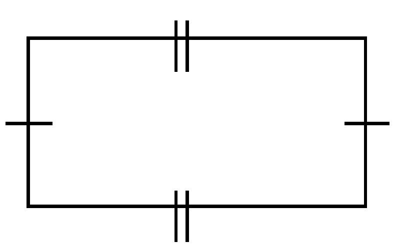
<u>Properties of squares</u>

i) It has all four sides equal.
ii) It has four vertices/corners.



iii) Opposite sides are parallel.
iv) It has four lines of folding symmetry.

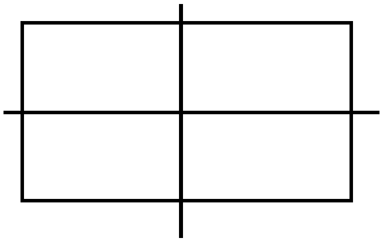
<u>D Rectar</u>



<u>Properties of a rectangle</u>

i) It has four opposite sides equal
ii) It has each angle at 9o°
iii) It has four vertices.
iv) It has two lines of folding symmetry.

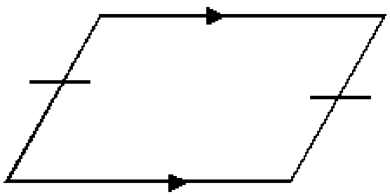
v) Its opposite sides are equal and parallel.



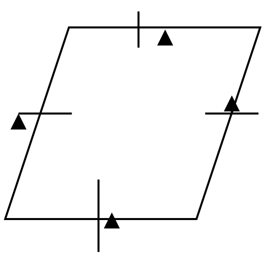
i) Two opposite sides are equl
ii) It has four right angles.
iii) It is an oblong shape.

E) Parallelogram

i) It has four sides
ii) It has two opposite sides equal.
iii) Its opposite sides are parallel.

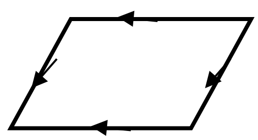


F) A Rhombus



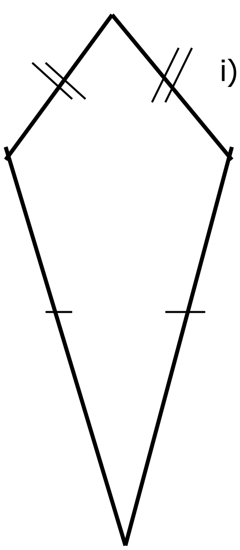
Properties of a Rhombus

i) It has all four sides equal.
ii) Its opposite sides are parallel

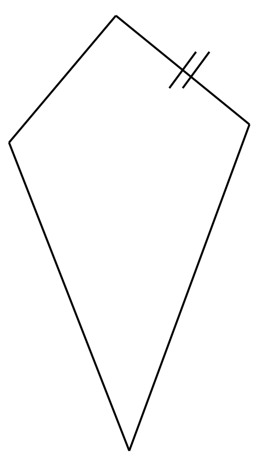


G) A Kite

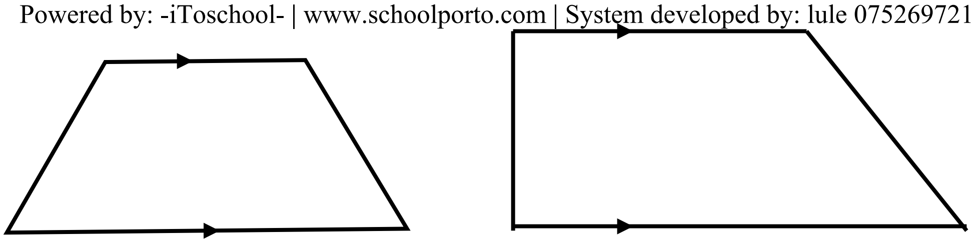
Some properties of a kite



i) It has two opposite sides equal.



H) Trapezium

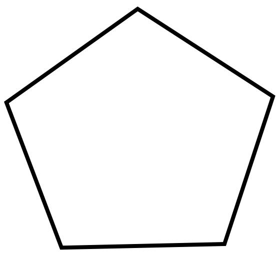


Properties of a trapezium

i) It has one pair of opposite sides parallel

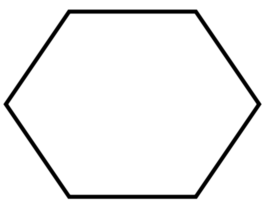
I) Pentagon

A Pentagon is polygon having five sides.



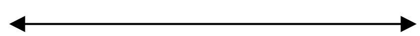
J) Hexagon

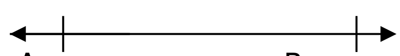
It is a polygon having six sides.



Note: when all given sides of a polygon are equal, it is called a regular polygon

LINES

a) **A line** is a continuous set of points running in opposite directions.
OR A line is a set of points extending in either direction.
A line is represented by 

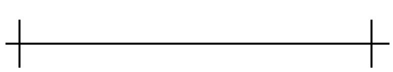
E.g. Line AB is shown as 

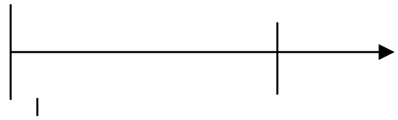
And is written as $\overleftrightarrow{AB}$

A line doesn't have end points.

- **A point** is a fixed location in space. It is represented by a dot.

b) A **line segment** is a part of a line with two end points.
E.g. Line segment AB is represented as below and written as $\overline{AB}$



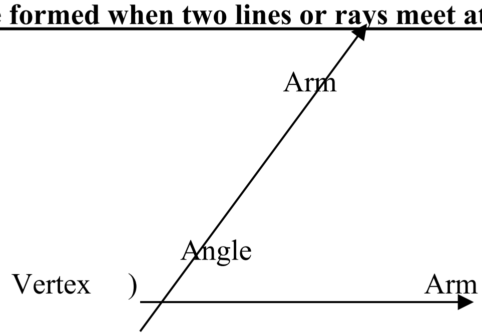
c) **A ray** is a part of a line having a starting point and no ending point.
E.g. Ray AB is shown as 

A ⟶ B

And it is written as AB

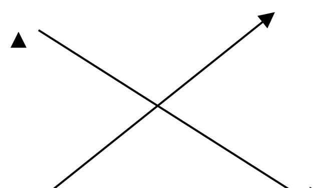
ANGLES

i) An angle is a space formed when two lines or rays meet at a point.



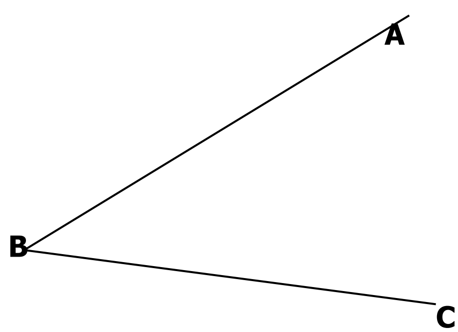
ii) The point where two lines/rays meet to form an angle is called a vertex.

Two lines intersecting one another form an angle at a vertex (intersection point.) e.g.



iii) The two lines that form an angle are called arms.

iv) The symbol for an angle is



NAMING ANGLES

This angle can be named in the following ways,

i) Angle ABC OR ∠ABC

ii) Angle CBA OR ∠CBA

iii) Angle B OR ∠B

TYPES OF ANGLES

i) **Right Angle**

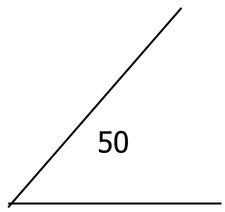
It is an Angle which measures 90

ii) <u>Acute Angle i</u>

It is an angle which measures less than 90

Examples of acute angles are:

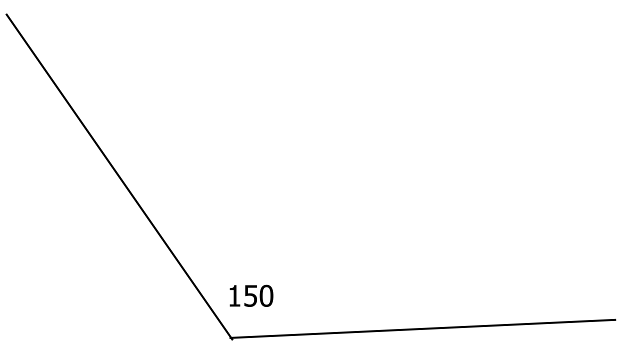
5 , 18, 30, 45, 89,



iii**) <u>Obtuse Angle</u>**

It is an angle which measures more than 90 but less than 180

Examples are 91, 100, 179 160 etc



iii) <u>Straight Angle</u>

It is an Angle which measures 180

Reflex Angle

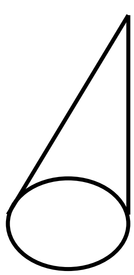
It is an Angle which measures more than 180 but less than 360
Examples are 181, 205, 330, 359

256

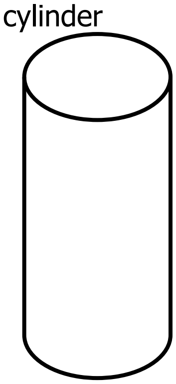
SOLID FIGURES.

a) Drawing and naming

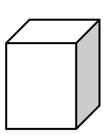
Cone



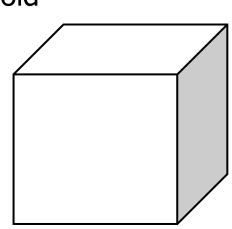
cylinder



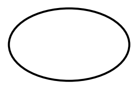
cube



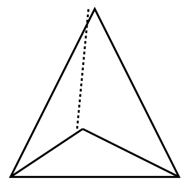
cuboid



sphere

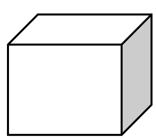


Triangular pyramid



b) Examples of real objects for the geometrical shapes.
e.g
i) Cylinder water tank (cylindrical
ii) Cone funnel
iii) Cube dice
iv) Cuboid duster
v) Sphere ball e.t.c.

Naming faces, edges, and vertices of geometrical shapes.
e.g cube



A cube has 6 faces
8 vertices
12 edges.

Completing the table.

Solid figure	Name	No. of faces	No. of vertices	No. of edges
	cube	6	8	12
	cuboid	6	8	12
	cone	1 (circular)	1	-
	Cylinder			
	sphere	-	-	-
	Square pyramid	5	5	8

REF: Understanding Mtc Bk 4 pp 113- 118
Mk Pri. Mtc 2000 Bk 4 pp 125 – 132.

CURVES.
A curve is a bent line

1. Open curves

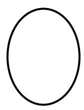
Open curves are drawn from a given point without lifting the pencil and avoiding going back to the starting point. e.g

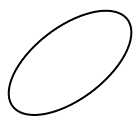
1. Closed curves.
   Closed curves are drawn from a given point without lifting the pencil but going back to the starting point. e.g.

2. Intersecting curves
   Intersecting curves are formed when the lines are drawn, crossing one another. e.g.

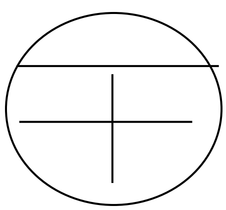
Simple closed curves

1. Simple closed curves are drawn from a given point back to the same point.
2. The lines must not intersect each other.
3. They always form clear shapes. e.g.

(i)  A circular curve is a simple closed curve.

(ii)  An oval is a simple closed curve.

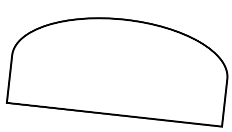
PARTS OF A CIRCLE



R = radius
D = diameter
C = chord

(i) Radius starts from the center to the edge of the circle.
(ii) A diameter starts from one point on the edge of the circle, through the center to another point on the edge of the circle.
(iii) A chord is any straight line across a circle.
(iv) Circumference is the distance round the circle.
(v) A semi circle is a half of a circle.

e.g

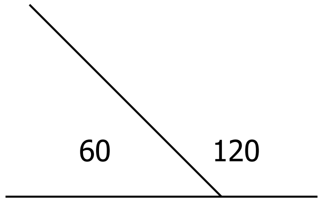


(vi) A quadrant is a quarter of a circle.
e.g

i) Supplementary angles.

Angles which add up to 180^0 are called supplementary angles.

e.g

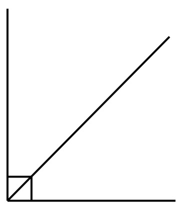


$< 120^0$ and $< 60^0$ are supplementary angles.

ii) Complementary angles.

Complementary angles add up to 90^0

e.g

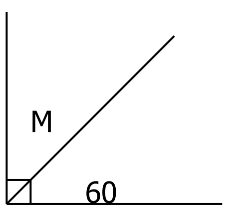


$< 30^0$ and $<60^0$ are complementary angles.

REF: Mk pri. Mtc 2000 (old) Bk 4 pp 137.

Finding unknown angles.

Example.



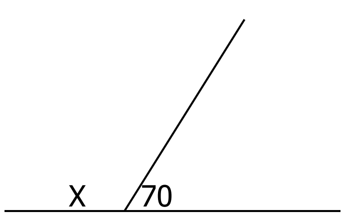
Find the value of m

$m + 60^0 = 90^0$ (complementary angles)

$m + 60^0 - 60^0 = 90^0 - 60^0$

$m = 30^0$ Ans.

(i) Find the size of angle x in degrees.



$X + 70^0 = 180^0$ (supplementary angles)

$X + 70^0 - 70^0 = 180^0 - 70^0$

$X = 110^0$ Ans.

Drawing and measuring angles using a protractor

Examples: Draw the following angles using a protractor,10,20,30,40,50,60,70,80,90.

P.4 Mathematics lesson notes Term III

Length

a). Measuring line segments with 5 cm full and parts of units.

Eg. i). 3cm, 2cm, 5cm, 6cm etc. ii). 3.5cm, 6cm, 2.5cm, 4.5cm etc.

b). Conversion of metric units.

Changing metres into cm.

Eg. 1 m = 100cm 2m = (100 x2) cm there fore 2m – 200cm.

$5.5m = \frac{55}{10} \times 100$

$= \frac{5500}{10}$

$= 550$

ii). **Changing cm into metres**.

e.g 700cm

100cm =1 m

1cm = $\frac{1}{100}$ m

700cm = $\frac{1}{100}$ x 700 m

$\frac{700}{100}$m = 7m

250 cm

1 cm = $^1/_{100}$m

250 cm = $^1/_{100}$ x 250

= $\frac{250}{100}$m

250 cm = 2.5 m

Changing kilometers into metres

e.g 1km = 100m

1.5 km = $\frac{15}{10}$ x 1000

$\frac{15000}{10}$

1.5 km = 1500m

changing metres into kilometers

1m = $\frac{1}{1000}$ km

1200m = $\frac{1}{1000}$x 1200

$\frac{1200}{1000}$

1200m = 1.2 km

Application of equivalent tables

M	1.5	2.5	3.3	5.5	4.6
Cm	150	250	330	550	460

Ref: Mr. bk 4 pg 186 – 192 understanding mtc

Pg. 155 – 156

Addition of length.

e.g

M	CM
3	40
+2	70
6	10

side work

110 ÷100

=1r 10

= 1m 10 cm

KM	M
3	250
+3	080
6	330

Multiply 3km 700m by 5

km	m
3	700
x	5
18	500

Side work
3500 ÷1000
= 3 r 500
3km 500m

Subtraction

M	cm
7	35
-2	14
5	21

Division

	M	cm
	1	09
3	3	27
	3	27
	0	0

	km	m
	1	040
9	9	360
	- 9	36

Word problems.

e.g Out of the 5m Sarah ran 3m 50cm. what length didn't she cover?

M	cm
5	00
-3	50
1	50

1 m 50 cm was uncovered
Ref Mk primary math
bk pg.1 187 – 199

Understanding mtc bk 4
Pg 157 – 178

Perimeter of common polygons.

Triangle : P = S + S + S

Pentagons: P = S + S + S + S + S

Squares: P = S + S + S + S

Rectangles: P = L + W + L + W

Finding sides when perimeter of squares and rectangles is given

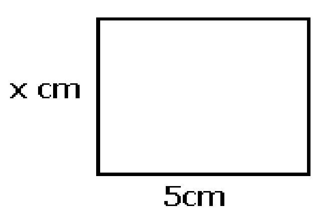
e.g length = 5 cm

width = x cm

perimeter = 20cm

Find the length of the rectangle.

sketch



P = 6 + 6 + x + x

2x + 12 = 20 cm

2x + 12 – 12 = 20 – 12 cm

2x = 8

x = 4cm

Find the side of a square whose perimeter is 12 m

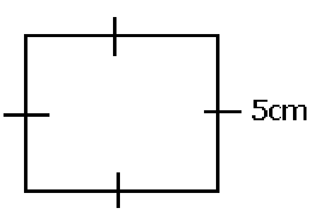
P = S + S + S + S
4S= 12m
S = 12 ÷ 4 m
S = 3 m

Ref: primary MTC bk 4 pg. 206 – 208

Areas

Areas of squares

A = L X L (sq units)

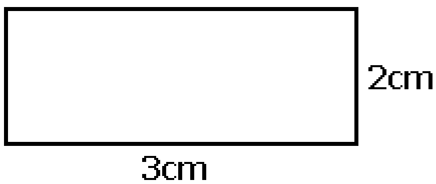


A = L X L

A = (5 x 5) m^2

$\underline{A = 25m^2}$

Areas of rectangles



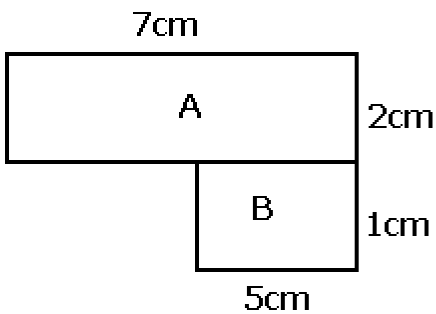
A = L x W

A = (3 x 2) cm^2

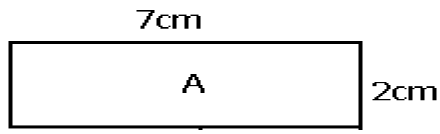
$\underline{A = 6\ cm^2}$

Area of two parts.

b). In a rectangle or square.



Area of A

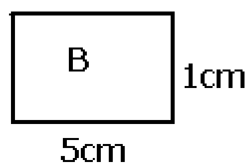


A = L x W

A = 7 x $2m^2$

$\underline{A = 14cm^2}$

Area of B



A = L x W

A = 5 x 1 m^2

$\underline{= 5cm^2}$

<u>Therefore the total area:</u>

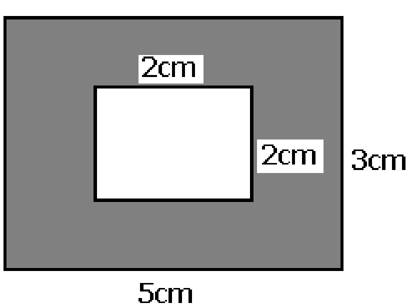
Total area: = (14 + 5) cm^2

$\underline{= 19\ cm^2}$

Ref: Pri. MTC pg. 206 – 213

Peak MTC (six) pg. 10

Area (difference) in rectangles and squares.



A = L x W

= (5 x 3) cm^2

= $\underline{15\ cm^2}$

A of square

A = L x L

= 2 x 2 cm^2

$\underline{= 4cm^2}$

A of shaded part = Area of rectangle – area of square

= (15 – 4) cm^2

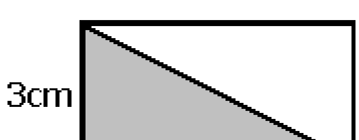
$\underline{= 11\ cm^2}$

Ref Mk primary MTC bk5

Pg. 212 – 213 peak maths six pg 11 and 47.

Area of a triangle.

Find the area of the shaded part



A = L x W

= 3 x 6

= $\underline{\underline{18\ cm^2}}$

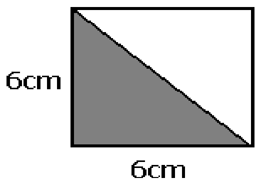
½ of 18 cm^2

= ½ x 18

= $^{18}/_2$

$\underline{\underline{9cm^2}}$

A of ½ of the rectangle

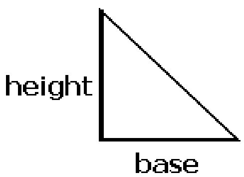


Find the area of the shaded part

Shaded part = ½ of the square
A of the square = L x L
= 6 x 6 cm
= $\underline{\underline{36cm^2}}$

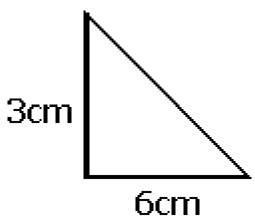
A of shaded part = ½ of 36
= ½ x 36 = $^{36}/_2$
= $\underline{\underline{18\ cm^2}}$

Area of right angled triangles.



Formular
Area = ½ x base x height
= ½ x bx h

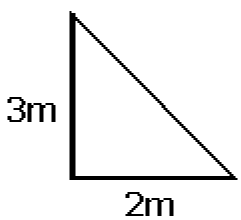
e.g Find the area of the triangle below.



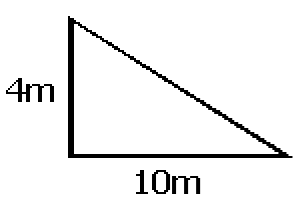
A = ½ x b x h
A = ($^1/_2$ x 6 x3) cm^2
A = $\frac{(1 \text{ x } 6 \text{ x } 3)}{2}$ cm^2
= 18 ÷ 2
= $\underline{\underline{9\ cm^2}}$

<u>Complete problems</u>

e.g Find the area of triangles below.



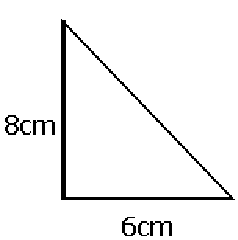
To find area, use the base and perpendicular height
A = ½ x b x h
A = 2 x 3 m^2
A = $\frac{6}{2}$ m^2
$\underline{\underline{A = 3\ m^2}}$



A = ½ x b x h
A= ½ x 10 x 4 m^2
A = 10 x 2 m^2
$\underline{\underline{A = 20\ m^2}}$

<u>Word problems.</u>

A right angled triangle has base 6 cm, perpendicular height 8 cm. find its area sketch



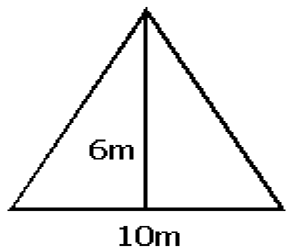
A = ½ x b x h

A = ½ x 6 x 8

A = 3 x 8 cm

A = 24 cm^2

An isosceles triangle had a base of 10 m the other two sides 8 m each and perpendicular height of 6m find its area sketch



A = ½ x b x h

A = ½ x 10 x 6 m^2

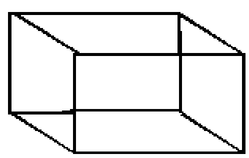
A = 5 x 6 m^2

A = 30 m^2

Ref Mk Pri. MTC bk 5 pg 165
Peak Maths six pg 46
Mk Pri. MTC bks 4 pg 214 – 218

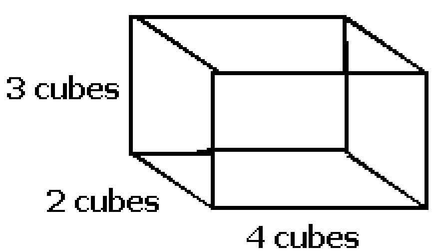
Volume

1. Volume is the amount of space inside a container
2. Volume can be measured using cubes
3. A cube is a solid with all sides equal.
4. We can arrange cubes to form a solid using a cube box.



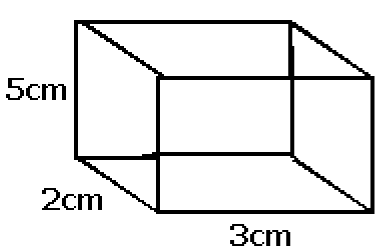
2 + 2 + 2 + 2 = 8 cubes boxes
= 8 cubic units
Volume = cubes at the base multiplied by the number of layers
= 2 x 2 x 2 = 8 cubes

formula
Volume = (base area) x height



Base area = (4 x2)
= 8 cubes
height = 3 cubes
volume = 8 x 3 cubes
volume = L x W x H
= (4 x 2) x 3 cubes
= 24 cubes

Example 2
Find the volume of this box



V = (L x W) x H
V =(3 x 2) x 5 cm^3
= 6 x 5cm^3
= 30cm^3
Ref: MK Primary MTC bk 5 pg 168 – 171
St.(pri) MTC 1 A pg 279 – 280

MONEY.

Revision of P.3 work.

Conversions

eg. How many 50 coins make 100.

50 + 50 = 50 x 2 = 100

2 x 50 coins make 100 or 100 ÷ 50 = **2 coins**

Addition and subtraction of shillings.

Eg. Add shs 150 to sh 10000

10000
+ 150
10150

How much change will you get from a one thousand shilling note if you spent sh. 350?

1000 – 350 = sh.650. There fore my change is sh.650

Ref: Mk pri. Maths bks 148 – 150

BUYING AND SELLING.

Find the cost of more items when the cost of one is given e.g 1 tin of oil costs 3000. finds the cost of 3 tins.:

1 tin cost sh. 3000

2 tins cost sh. (3000 x 3)

= sh. 9000

Finding the cost of one item when the cost of many is given eg. 4 sweets cost 400 shillings. Find the cost of 1 sweet. ⇒ 4 sweets cost sh.400

⇒ 1 sweet costs sh. 400 ÷ 4

= sh. 100.

Simple shopping

e.g price list

milk 1000/= @ packet or per, each, every

sugar 1600/=@ kg.

Jane bought 2kg of sugar, 4 packets of milk and 1 pkt of blue band. Find her total expenditure.

Item	Qty	Method	Amount
sugar	1	1 x 1600	1600
Milk	4	4 x 1000	4000
Blue band	1	1 x 1500	1500
Total expenditure			**7100/=**

If she had sh.10000 what was her change?

Sh.10000 – 7100 =sh. 2900

Her change was sh. 2900.

Juma bought 5 books at sh. 7000, 6 pens at sh. 1500 and 4 cups at sh. 2000. Find the total cost of all those items.

Sh.7000
Sh.1500
+sh. 2000
sh. 10500

The total cost was 10500 shillings.

Ref: Mk prim. MTC bk 4 pg 133 – 156

PROFIT AND LOSS.

A PROFIT

1. Profit is gain / an increase from original
2. Profit is realized when selling price is more than the buying price

P = SP – BP

E.g: Tom bought a goat at sh.8000 and sold it at sh. 10000. Find his profit

P = SP – BP

P = sh. (10000 - 8000)

P = sh. 2000

His profit was 2000 shillings

Ref: Pri. MTC bk 4 pg. 156

LOSS

1. Loss is the reduction from the original/ buying price
2. Loss is realized when selling price is less than buying price.

e.g.

Mother bought a bag at sh. 15000 and sold it at sh. 10000. Find her loss.

Loss = BP – SP

Loss = sh. (15000 – 10000)

= sh. 5000

Her loss was 5000 shillings

Ref: MK Pri. MTC bk 4 pg. 157

TIME

Definition of terms

a.m = anti meridien (morning)   p.m. = post meridien (afternoon)

1 minutes = 60 seconds 1 hour = 60 minutes

1 day = 24 hours 1 week = 7 days

2 weeks = 14 days (fortnight) 1 month = 4 full weeks 1 year = 12 months.

An ordinary year has 365 days. A leap year occurs every after four years

Note:

1. When February has 29 days that year is a leap year
2. A leap year occurs every four years.
4. To prove a leap year the given year must be divisible exactly by 4.

e.g Which of these years are leap years?

a). 1992 ÷ 4 = 498 ÷ 1992 was a leap year

b). 2005 ÷ 4= 501 r 1÷ 2005 was an ordinary year.

TELLING TIME

15 minutes past or to = a quarter past or to the next hour

30 minutes past = half past the hour.

Writing time eg. 1 hr after

1. midnight = 12:00 a.m
2. 30 minutes after midday = 12:30 p.m

Ref: Pri. MTC bk 4 pg. 173 – 175 – 183

Conversions

Changing minutes to seconds

1 min = 60 sec.

10 min = 60 x 10 sec

= 600 sec

Changing hours to minutes

1 hr = 60 minutes

1.5hrs = $^{3}/_{2}$ x 60 min

1 ½ = 90 min

Changing minutes to hours.

60 min = 1 hr

1min = $^{1}/_{60}$hrs

90mins = $^{1}/_{60}$ x 90hrs

= $^{9}/_{6}$hrs

90 mins = 1 ½ hrs

Word problems

e.g: A bus takes 4: 30 hrs to arrive in Kampala city. What time is that in minutes.

1hr = 60 min

4.5hrs = $^{90}/_{2}$ x $^{60}/_{1}$min

4:30hrs = 270 min

Ref: pri. MTC bk 4 pg 162 – 163

Addition of time.

Hrs	Min
2	45
+3	30
6	15
	75

Side work

75 ÷ 60 = 1r 15

1hr 15min

Multiplication of time

Hrs	Min
7	15
x	3
21	45

MK Pr. MTC bk 4 pg 165 170 – 171

Subtracting time

Hrs	Min
3	40
- 1	50
1	50

Division of time

	Hrs	min
	2	10
3	6	30
	-6	30
	0	0

Ref: Mk pri MTC bk 4 pg 168 – 169, 172

Time duration

e.g A girl started walking from home at 7:15 am. She reached school at 8: 15 am. How long did it take her?

Hrs	Min
8	15
- 7	15
1	00

It took her 1 hr.

Ref: Mk Pri. MTC bk 4 pg 176

HOURS, DAYS AND WEEKS CONVERSIONS.

E.g.

1 day = 24 hrs

12 days = 24

x 12

48

+ 240

288 hrs

1wk = 7 days

8 wks = 7 x 8 days

⇒ 56 days

7 days = 1wk

49 days = 49 ÷ 7

⇒ 7 weeks

Addition of weeks and days.

Wks	days
12	3
+ 15	6
28	6
	9

Side work

9 ÷7 = 1r 2

1 week 2 days.

Subtraction of weeks and day

Wks	days
7	2
- 1	4
5	5

Ref. MK Pr. MTC bk 4 pg 177 – 182

CAPACITY.

Capacity is the amount of liquid a container can hold.

The standard unit measure for capacity is litres.

CONVERSIONS

Full litres into fractions

1. 1 litre = 2 half litres

   2 litres = (2 + 2) half litres

   = 4 half litres.

2. Putting together fractions of litres e.g

   ½ litres + 3 ½ litres

   3 + ($^1/_2$ + ½) litres = 3 + $^2/_2$ litres

   = 3 + 1 litres

   = 4 litres

Using the equivalence table.

KL	HL	DL	L	dL	CL	ML
1	0	0	0	0	0	0

Converting litres into ml

1 litre = 1000ml

3 litres = (1000 x 3) litres

= 3000 litres

Converting ml into litres

1000ml = 1 litre

5000ml ÷1000

= 5 litres.

Ref: MK pri MTC bk 4 pg 222 – 225

Addition of capacity

	Litre	mlitre
	7	**250**
+	**2**	**400**
	9	**650**

Multiplication of capacity.

L	ML	side work
3	**400**	1600 ÷1000
x	**4**	= 1 litre
13	**600**	600ml

Subtraction of capacity.

	L	ML
	7	97
-	3	15
	4	82

Ref: MK Pri. MTC bk 4 pg 224

MASS

Conversions

Kg to grams and vice versa

converting grams to kilograms

1.5 kg into grams	1500g to kg
1 kg = 1000grams	1000g = 1kg
1.5 = $^3/_2$ x 1000	1500 ÷1000
3000 ÷2 = 1500grams	= 1.5 kg

Addition of weight

Kg	g	
4	200	side work
+ 3	850	1050 ÷ 1000
8	050	1 kg 50g

Multiplication of weight

Kg	g	
7	200	side work
x	9	1800 ÷1000
64	800	1 kg 800g

Subtraction of weight.

Kg	g
300	1150
- 50	200
249	950

Ref: MK Pr. MTC bk4 p 228 - 235

Temperature

1. Temperature is the hotness or coldness of an object
2. When something is hot, we say it has a low temperature
3. When something is cold we say it has a high temperature.
4. To measure temperature, we use an instrument called the thermometer.
5. Temperature is measured in degrees Celsius (^{0}C) or degrees Fahrenheit (^{0}F)
6. A healthy person has a normal body temperature of 37^{0}C or 98.6^{0}F.
7. When water is boiling its temperature is 100 degrees Celsius(100^{0}C) or 212 degrees Fahrenheit (212^{0}F)
8. When water freezes (ice) its temperate is 0^{0}C or 32 ^{0}F

Exercise: Reading temperature on the thermometers.

Ref: MK Pr. Maths bk 4 pg 237 – 239

GRAPHS AND INTERPRETATION OF INFORMATION

A graph is a drawing or diagram that uses lines, bars or pictures to show how two or more quantities or measurements are related to each other.

Types of graphs

a). Pictographs b). bar or column graphs.

Pictographs these are graphs which represent information in form of pictures.

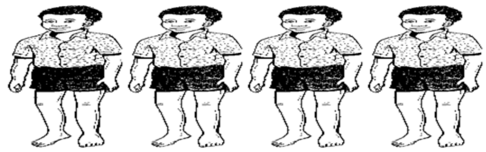
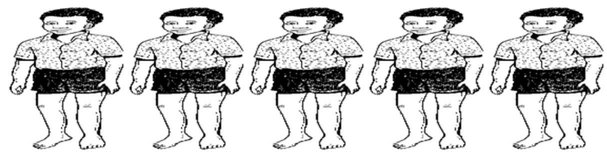
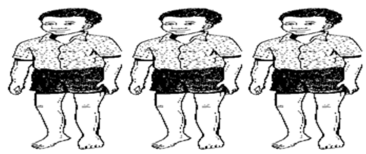
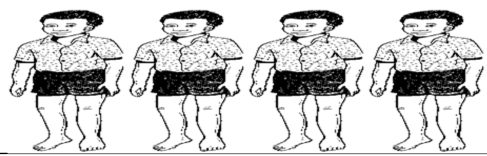
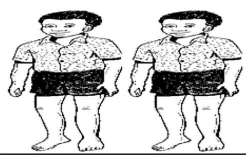
Features of pictographs

a). Title / heading: This tells us what the graph is about.

b). Scale/ key: This tells us what each picture or symbol stands for.

eg.I The graph below shows the attendance of a P.4 class in a week.

Use a scale  to represent 2 pupils.

Day	Pupils absent
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

1. On which day was the highest attendance recorded? **Tuesday.**
2. How many pupils attended on Wednesday: = 2 x 3 = **6 pupils.**
3. On which two days was the attendance the same? Monday and Thursday.
4. How many more pupils were present on Monday than Wednesday?

   Monday: 2x4 = 8

   Wednesday: 2 x 3 = 6

   8 – 6 = 2 more pupils
5. Work out the total number of pupils who attended from Monday to Friday.

Monday	2 x 4	= 8
Tuesday	2 x 5	= 10
Wednesday	2 x3	= 6
Thursday	2 x 4	= 8
Friday	2 x 2	= 4
Total		**= 36 pupils.**

eg. II

The information below shows pupils who were absent from school in week one.

Days	Monday	Tuesday	Wednesday	Thursday	Friday
Pupils absent	12	16	12	9	10

Questions

1. Draw a bar graph to represent the above information.
2. How many pupils were absent the whole week?
3. How many more pupils were absent on Tuesday than on Thursday?

Eg. III

The rainfall in seven months was observed and recorded in the table as shown below.

Months	Jan	Feb	Mar	Apr	May	Jun	Jul
Rainfall in mm	40	35	60	70	80	60	45

1. Draw a bar graph for the information above.

   Vertical scale: 1 cm represents 10 mm

   Horizontal scale: 1 cm represent 1 month.
2. Which month had the highest rainfall?
3. Which two had the same amount of rainfall?
4. How much was recorded in April?
5. How much more rainfall was recorder in June than in February?

- Interpreting drawn bar and line graphs
- Counting tally marks when handling data.
- Grouping of data using tally marks.