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Lesson Notes P.6 Math

2022

TOPIC / UNIT ONE - SET CONCEPTS
LESSON 1
Sub topic: - Types of sets
Content:

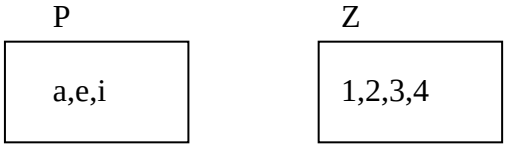
1. Types of sets: (a) Equal sets e.g
   (b) Equivalent sets
   (c) Unequal

Examples

1. Equal sets

2. Equivalent sets / matching sets

3. Non equivalent sets



ACTIVITY

The pupils will attempt exercise 1 : 1 page 2 from A new MK primary MTC pupils' BK 6. / Mk new edition pg 1-2 / understanding mtc pg 1-3/ fountain pf 1-8

REMARKS

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LESSON 2

Sub topic: Types of sets

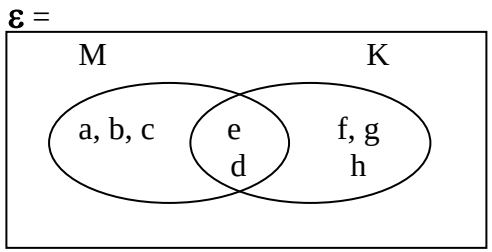
Content

(a) Intersecting sets (∩) / joint sets
A set of common members from two or more sets.
(b) Union sets (∪)
A set of all elements in the two or more sets.
(c) Universal set (**ε**)
The biggest set from which other smaller sets are got.
(d) Joint and disjoint sets

Examples

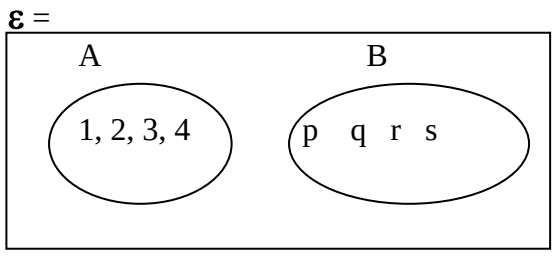
Sets M = {a, b, c, d, e, }
K = {d, e, f, g, h, }
∴ (i) M ∩ K = {e, d}
(ii) K ∪ M = {a, b, c, d, e, f, g, h}
(iii) Universal set (ε)

The biggest set from sets M and K i.e



ε = {a, b, c, e, d, f, g, h}

Disjoint set
A = {1,23,4} B = {p, q, r,s}



Activity
Mk new edition pg 3-4
Understanding mtc pg 4-7
Fountain pg 7-8

Remarks

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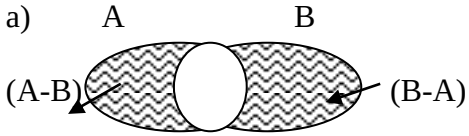
LESSON 3

Sub topic : Types of sets
Content:

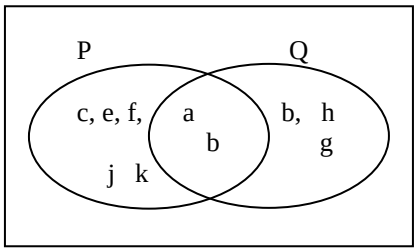
(a) Difference of sets
i) shading of regions
ii) describing regions
(b) Complement of sets
i) find complement of sets
ii) shading regions with complement of sets

Examples:

a)



b) Complements
Given that **ε**



Find:
(i) P^1 = {b, h,g, j, k}
(ii) Q^1 = {c, e, f, j, k }

(iii) $(P \cap Q)^1$
(iv) $(P \cup Q)^1$

(a) Difference sets:
(i) P – Q = {c, e, f}
(ii) Q – P = {b, g, h}
(b) Empty sets e.g
A = {all goats with wings}

Activity
Mk new edition pg 10
Remarks

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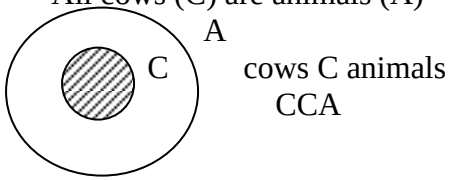
LESSON 4

Sub topics **sub sets (⊂)**

Content:
(a) Listing / forming subsets
(b) Numbers of sub sets
(c) Number of proper subsets

Examples:
(i) Representing subsets on diagrams
i.e All cows (C) are animals (A)



(ii) Listing/ forming sub sets
A = {x, y}
Sub sets are { }, {x}, {y }, {x, y}
(iii) Find number of subsets;

Formula: 2^n (n stands for number of members)
Eg set R = {1, 2, 3}
No of subsets = 2n
= 2^3
= 2 x 2 x 2
= 8

iv) find number of proper subsets
(2^n-1)
Set P = {a,b,c,d}
No of proper subsets
(2^n-1)
2^4-1
(2x2x2x2)-1
16-1
15 proper sub sets

Activity
Mk new edition pg 6-7
Fountain mtc pg 8-10
Understanding mtc pg 4-6

Remarks
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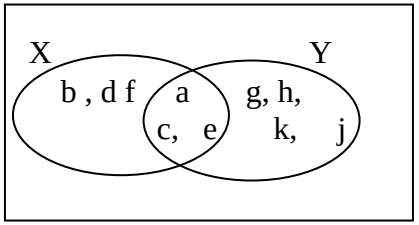
LESSON 5

Subtopic: Finding number of elements in sets.
Content: (a) listing members of sets
(b) Number of elements in sets.
Examples: (i) Find members in set N
N = {prime numbers between O and 10}
N = {2, 3, 5, 7}
(ii) n (N) = 4
(i) Use the venn diagram to answer questions

ε



Find
(a) n (x)
But x = {a, b, c, d, e, f, }
∴ n (x) = 6

p q
(b) n (y)
(c) n (X n Y)
(d) n (Y – X)
(e) $n (X)^1$

Activity
Mk old edition pg 20-22

Remarks
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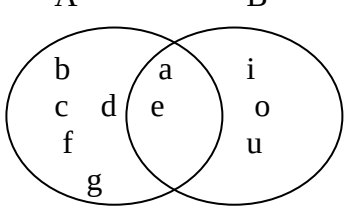
LESSON 6

Subtopic: Application of set concepts.

Content: (a) Representing information on a venn diagram

Given that set A = {a,b,c,d,e,f,g} B = {a,e,I,o,u}

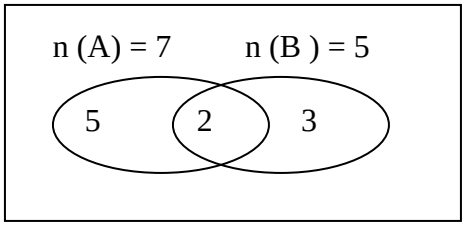


n(A) = 7
n(B) = 5
n(A∩B) = 2
n(A-B) = 5
n(B-A) = 3
n(A∪B) = 10
(b) Interpreting information given on a venn diagram

Examples:

(i) Given that n (A) = 7, n (B) = 5 and n (A n B) = 2

(ii) Draw a venn diagram to represent the above information



Activity

Mk old edition pg 22-25

Remarks

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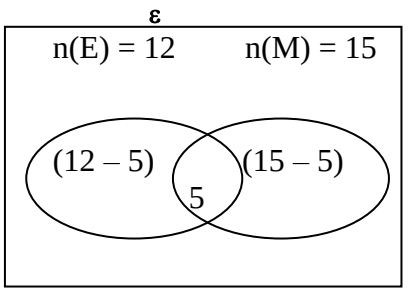
LESSON 7

SUBTOPIC : Application of sets:

Content: Interpreting word problems using the venn diagram (real life situations)

Examples: (a) In a class, 12 pupils like English (E), 15 pupils like Maths (M) and 5 pupils like both Eng and Maths. Draw a venn diagram to represent the information above.



(i) The class has 7 + 5 + 10 = 22

∴ ε = 22 pupils

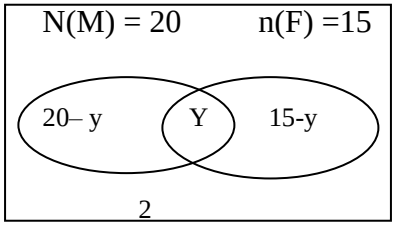
(ii) How many like one subject only?

7 + 10 = 17 pupils

(b) In a class of 30 pupils, 20 take Mirinda (M), 15 take Fanta (F) and some take both drinks while 2 take neither of the drinks.

(i) Show this information on a venn diagram

ε = 30



Let y represent those who take both.

(ii) How many pupils take both drinks?

20 – y + y + 15 – y + 2 = 30 20 – y

20 + 15 + 2 + y – y – y = 30

37 – y = 30

37 – 37 – y = 30 - 37

-y = -7

-1 -1

Y = 7

Activity

(i) Understanding mtc pg 13-15

(ii) Fountain p g 10-13

(iii) Mk new edition pg 8-9

Remarks

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LESSON 8

Sub topic : Probability

Content: (i) The idea of probability / chance

(ii) Formular

Prob. = n (Expected outcome) or n (EE)
n(possible outcomes) n (SS)

(iii) Application

Example: If B = {counting numbers less than 10}

∴ B = {1, 2, 3, 4, 5, 6, 7, 8, 9}

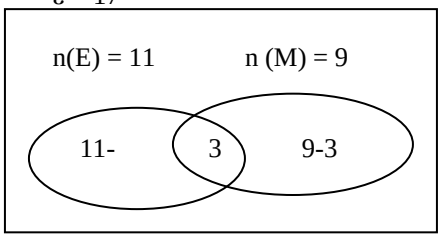
(a) Find the probability of picking an even number

Even numbers = {2, 4, 6, 8}

n (Expected outcomes) = 4
n (possible outcomes) = 9
∴ Prob = $\frac{4}{9}$

(b) In a class of 17 pupils, 11 like Eng (E) and 9 like Maths (M) if a pupil is picked at random from the class, what is the probability of picking a pupil who likes Maths only?

ε = 17



Pupils who like both:

(11 + 9) – 17
20 – 17
3

Pupils who like Eng only Maths only
(11 – 3) (9 – 3)
Prob = $\frac{8}{17}$ $\frac{6}{17}$

Activity
Fountain pg 14-16
Mk new edition pg 10-12

Remarks

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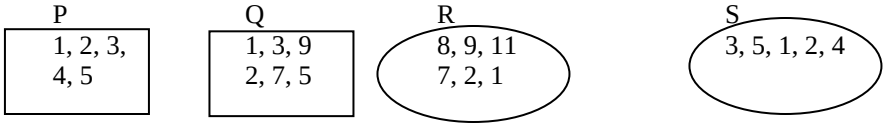
LESSON 9

Revision work on set concepts

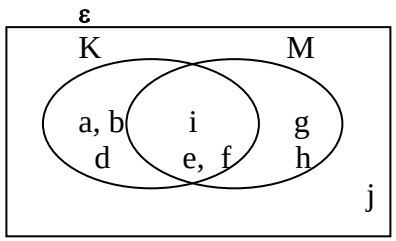
1. Write equal, unequal or equivalent against each



(i) P and Q (ii) R and S (iii) Q and R
(iv) Q and S (v) P and S

2. If P = {even numbers less than ten}
(a) Find n (P)
(b) How many subsets has set P?

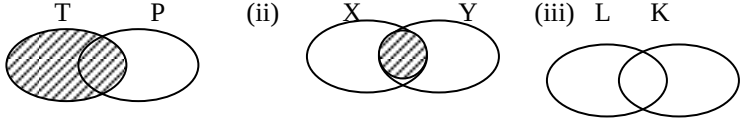
3. Study the venn diagram and use it to answer the questions about it.



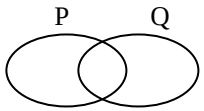
Write down the elements for:
(i) K (ii) M
(iii) K n M
(iv) M u K (v) K – M)
(vi) K^1

4. (a) List down all the subsets in A if A = {o, u ,i, s}
(b) A set has five elements how many subsets has set A?
(c) Given that a set has 16 subsets. Find the numbers elements in this set.

5. (a) Draw and shade these sets.
(i) Rn P (ii) M u N (iii) Z – F
(b) Describe / name the shaded regions below:
(i) T P (ii) X Y (iii) L K



6. Set P = {2, 3, 5, 7}, Q = {1, 2, 3, 4, 6, 7, 8}
(a) Complete the venn diagram



(b) Find n (P n Q) (ii) n (P u Q) (iii) n (Q – P)
(iv) n (P) only (v) n(Q) (vi) $n (P)^1$

7. In a market 24 traders sell cloth (C), and 30 traders sell food (F). If 16 traders sell both items, draw a venn diagram and find out how many traders sell only one type of commodity.

8. In a class of 30 pupils, 18 eat meat, 10 eat beans and 5 do not eat any of the two types of food.
(i) Show this information on a venn diagram
(ii) How many pupils eat meat only?
(iii) Find those who eat beans only.
(iv) How many pupils eat only one type of food?
(v) Find the number of pupils who eat both types of food.

(vi) What is the probability of choosing a pupil at random who eats meat?

TOPIC/ UNIT TWO

THEME: NUMERACY
TOPIC: WHOLE NUMBERS
LESSON 1
Subtopic: Value values
Content: Value of digits in numerals
Examples: (i) Find the place value
(ii) Find the value of each digit

Number	Place value	value
9 4 3 8 7 2 5	Ones	5 x 1 = 5
	Tens	2 x 10 = 20
	Hundreds	7 x 100 = 700
	Thousands	8 x 1000 = 8000
	Ten thousands	3 x 10000 = 30000
	Hundred thousands	4 x 100000 = 40000
	Million	9 x 1000000 = 9000000

ii) Using operations to find values of digits

Activity
Mk new edition pg 14-15
Fountain pg 20-23

Remarks
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LESSON 2
Subtopic: Expanded form
Content (i) Expand using values / place values
(ii) Expand using powers of ten
Examples:
(a) Expand 6845 using values

Th HTO
6845 = (6 x 1000) + (8 x 100) + (4 x 10) + (5 x 1)
= 6000 + 800+ 40 + 5

b) Using power exponents
$6^3 8^2 4^1 5^0$ = (6 x 10^3) + (8 x 10^2) + (4 x 10^1) + 5 x 10^0)
6845 = 6.845 x 10^3

Activity
MK new edition pg 16-17
Understanding mtc pg 25
Fountain pg 23-24
Remarks
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LESSON 3

Scientific /standard form
Content: expanding number using scientific notation

Example: Express 6845 in scientific form
6845 = 6845 ÷10
684.5 ÷10
68.45 ÷10
6.845 x 10^3

LESSON 4

SUBTOPIC: Expressing expanded numbers as single numeral.
Content: (i) Expanded form of values
(ii) Expanded form of place values
(iii) Expanded form of exponents.
Examples: (a) Write in short:
4000 + 60 + 2
4000
+ 60
+ 2
4062

(b) (8 x 10000) + (7 x 1000) + (5 x 100) + (9 x 10) + (3 x1)

80,000 + 7,000 + 500 + 90 + 3
80000
7000
500
90
+ 3
87593

(c) $(6 \times 10^3) + (4 \times 10^2) + (2 \times 10^1) + (3 \times 10^0)$
$(6x\ 10 \times 10 \times 10) + (4\ 10 \times 10) + (2 \times 10) + (3 \times 1)$
6000 + 400 + 20 + 3
6000
400
20
+ 3
6425

(d) $6.42 \times 10^2 = 6.42 \times 100 = 642$

Activity
- Fountain pg 23-24
- Mk new edition pg 16-17

Remarks
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LESSON 5
Subtopic: Reading and writing numbers in words
Content : Expressing numerals in words to millions.
Examples A
9452
9000 – nine thousand
400 – four hundred
52 - fifty two
Therefore; 9452 = nine thousand four hundred fifty two

Examples: (b) write 1486019 in words
1000000 – One million
486000 - Four hundred eighty six
19 - Nineteen
∴ 1486019 = One million, four hundred eight six thousand nineteen

Activity:
MK new edition pg 18-19
Fountain pg 25.

Remarks
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LESSON 6
Subtopic: writing words in figures .
Content: Writing number words in figures to millions
Write in figures.
Examples A
Ffour hundred thousand, seven hundred sixteen

Solution:
Four hundred thousand 400000
Seven hundred sixteen + 716
400716

ii) One million one hundred one thousand eleven

Activity
MK new edition pg 18-19
Fountain pg 25.
Remarks
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LESSON 7
Subtopic: Rounding off whole numbers
Content: Round off to the nearest
(i) Ones
(ii) Tens
(iii) Hundreds
(iv) Thousands

Examples: (i) Round 677 to the nearest tens

6 7 7
+ 1 0 ∴677 = 680
6 8 0

(ii) Round 1677 to the nearest hundreds

1 6 7 7
+ 1 0 0
1 7 0 0 ∴ 1677 = 1700

iii) Round off 34567 to the nearest thousands

Activity

Mk old edition pg 47-48

Remarks

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LESSON 8

Subtopic: Decimal numbers

Content: Place values of decimal in words and figures.

Examples: (a) $\frac{1}{10}$ → One tenth – 0.1

Place value of 1 in 0.1 is Tenths.

(b) $\frac{8}{100}$ → Eight hundredths – 0.8

(c) Find the value of each digit

4 . 6

Tenths – 6 x $^1/_{10}$ (6 x 0.1) = 0.6

Ones – 4 x 1 = 4

Number	Place values	Values
6.73	6 – ones	6x1 = 6
	7 – tenths	7x1/10 = 0.7
	3 = hundredths	3 x 1/100 = 0.03

Activity

Mk old edition pg 42-44

Remarks

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LESSON 9

Subtopic: Reading and writing decimals in words and the vice verse

Content: (i) Writing decimals in words
(ii) Expressing decimals in figures from words

Examples: (a) Write 0.125 in words

0.125 = One hundred twenty five thousandths

(b) 18.4

18 → Eighteen

0.14 → Fourteen hundredths

18.14 → Eighteen and fourteen hundredths

(c) Twenty six and four tenths

Twenty six → 26

Four tenths → + 0.4

26.4

Activity

Mk old edition pg 45- 46

Remarks

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LESSON 10

Subtopic: Expanding decimal numerals

Content: (i) Expand using place values
ii) Expand using values
(iii) Expand using exponents

Examples: (i) Expand 3. 5 4

Hundredths – 4 x $^1/_{100}$ = 0.04

Tenths – 5 x 10 = 0.5

Ones = 3 x 1 = 3

∴ 3.54 = 3 + 0.5 + 0.04

(ii) Expand 4.62 using exponents/

0 -1 -2

4 . 6 2

$4.62 = (4 \times 10^0) + (6 \times 10^{-1}) + (2 \times 10^{-2})$

(iii) Write as a single numeral

(a) 3 + 0.5 + o.04

3
0.5
\+ 0.04
3.54

(b) Express in the shortest form

$(4x10^0) + (6x10^{-1}) + (2x10^{-2})$

$4 \times 100 = 4 \times 1 = 4$

$6 \times -10 = 6 \times {}^1/_{10} = 0.6$

$2 \times 10^{-2} = 2 \times {}^1/_{100} = 0.02$

4.62

Activity

The pupils will do exercises 8 : 8 and 8 : 9 A New MK 2000 BK 6 pg 59 (old Edn)

Remarks

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LESSON 11

Subtopic: Expressing decimal in scientific notation.

Content: Expend decimals of different place values in standard/ Scientific notation.

(a) Tenths
(b) Hundredths
(c) Thousandths

Examples:

(i) 0.4 in standard form
$0.4 = 4.0 \times 10^{-1}$

(ii) $2.52 = 2.52 \times 10^0$

(iii) $23.63 = 2.363 \times 10^1$

(iv) $464.241 = 4.64244 \times 10^2$

Activity

Express the following to standard form:

(a)	4.8	(b)	3.25	(c)	38.06
(d)	207.4	(e)	4819.2	(f)	23.63
(g)	49	(h)	29.7		
(i)	0.006	(j)	120.0		

Remarks

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LESSON 12

Content: Finding expanded decimals

Example

a) What number has been expanded

i) 3+0.5 + 0.04

ii) (4x10) + (6x1) + (7x0.01)

iii) $(6x10^3) + (4x10^1) + (9x10^{-2})$

Remarks

Ref: MK old edition pg 47-48

LESSON 13

Subtopic: Ordinary decimals

Content: (a) Arrange in ascending and descending order

Example: (i) Arrange the following in ascending and descending order
0.1, 2.0 and 0.04

$\frac{1}{10}$ $\frac{2}{1}$ $\frac{4}{100}$ (LCM = 100)

$\Rightarrow$ $\frac{1}{10} \times 100 = \frac{1 \times 10}{1} = 10$ (2^{nd})

$\frac{2}{1} \times 100 = \frac{200}{1} = 200$ (3^{rd})

$\frac{1}{4} \times 100 = \frac{1}{4} \times \frac{1}{1} = 4$ (1^{st})

Ascending order = 0.04, 0.1, 2.0

(ii) Arrange the following in descending order
3.5, 4.05, 0.45, 0.02

$\frac{35}{10}, \frac{405}{100}, \frac{45}{100}, \frac{2}{100}$ (LCM = 100)

$\frac{35}{10} \times 100 = 350$ $\frac{45}{100} \times 100 = 45$

$\frac{405}{100} \times 100 = 405$ $\frac{2}{100} \times 100 = 2$

∴ Descending order = 4.05, 3.5, 0.45, 0,02

Activity
The pupils will do exercises below:
(1) 1.5, 0.015, 0.015, 15.0 (Ascending order)
(2) 0.5, 5.5, 1.5, 5.1 (descending order)
(3) 0.33, 0.3, 3.3 (Ascending order)
(4) 0.2, 0.75, 0.5 (Descending order)
(5) 0.25, 0.5, 0.4, 0.6 (Ascending order)

Remarks
Ref: Trs' collection

LESSON 14

Subtopic: Rounding off decimals
Content : Round off to the nearest:
(a) Tenths / one place of decimal
(b) Hundredths / two places of decimals
(c) Thousandths / three places of decimal
(d) Ones / whole number

Example: (i) Round off 4.25 to the nearest whole no.

4 | .25
+ . 0 0
4 | .00 ∴4.25 ≏ 4

(ii) 29.67 to nearest tenths

29. 67
+ . 1 0
29. 70 ∴ 29.67 ≏ 29.7

(iii) 39.95 to nearest tenths

3 9 . 95
+ . 1 0
4 0 . 0 0 ≏ 40.0

Activity
MK old edition pg 48
Understanding mtc pg 33-35

Remarks

LESSON 15

Subtopic: Roman and Hindu Arabic Numerals

Content: (i) Reading writing Roman numerals to 10,000
(ii) Expressing Hindu Arabic numerals in Roman system.

Example: (i) Basic digits / numerals

Hindu Arabic	1	5	10	50	100	500	1000
Roman	1	V	X	L	C	D	M

(ii) 75 = 70 + 5
= LXX + V
= LXXV

(iii) 555 = 500 + 50 + 5
= D + L + V
= DLV

Activity
- Mk old edition pg 49-51
- Understanding pg 36-39
- Fountain pg 26-30

Remarks

LESSON 15

Subtopic: Expressing Roman Numerals to Hindu Arabic numerals
Content: Convert from Roman numerals to Hindu Arabic numerals

Examples: (i) Write LXXV in Hindu Arabic system

LXXV		
L	=	50
XX	=	20
V	=	+ 5
LXXV =		75

(ii) CCCXCIX

CCC	=	300
XC	=	90
IX	=	+ 9
CCCXCIX		399

(iii) CMLXIX

CM	=	900
LX	=	60
IX	=	9
		969

Activity

- Mk old edition pg 49-51
- Understanding mtc pg 36-39
- Fountain pg 26-30

Remarks

LESSON 16

Subtopic: Operations on Roman Numerals
Content: (a) Addition
(b) Subtraction
Examples: (i) Work out and answer in Hindu Arabic

XL	=	40
XV	= +	15
		55

(ii) Simplify in Roman system

LXXX – XX	subtract ∴60 = LX
LXXX = 80	80
XX = 20	- 20
	60

(iii) Peter had LIX goats and sold XIV goats
How many goats remained (answer in Hindu Arabic)

LIX	69
XIV	- 14
	55 goats

Activity

The pupils will do exercises below.

(1)	XI + IX	(6)	XXV – XV
(2)	VII + L	(7)	XL – VII
(3)	CD + XIV	(8)	XIX – IX
(4)	XVI + XIV	(9)	CM – CL
(6)	XX + III	(10)	Word problems

Remarks
Ref: Mk old edition pg 50-51

LESSON 17

Subtopic : conversion of bases
Content: (a) Names of non decimal bases to base twelve
(b) Counting in base two and five
Examples: (a) Base two (Binary)
Digits used are (0, 1)
(ii) Base five (
Uses (0, 1, 2, 3, 4)

Activity

Remarks

LESSON 18

Subtopic: conversing from base ten to base five
Content: (a) Change from base ten to base five
Examples: (i) Change 23 to base five

5	23	
	14	3

$\therefore 23 = 43_{five}$

b) Converting from base ten to binary base

19_{ten}

BW	BT	R
2	19	1
2	9	1
2	4	0
2	2	0
	1	

$19_{ten} = 10011_{two}$

Remarks

LESSON 20

Subtopic: Changing to decimal / base ten
Content:
Examples: (a) express 412_{five} to base ten

$^{2\ 1\ 0}$
$4\ 1\ 2_{five} = (4 \times 5^2) + 1 \times 5^1) + (2 \times 5^0)$
$(4x5x5) + (1x5)+(2x1)$
$100 + 5 + 2$
107_{ten}

Examples: (ii) change 1011two to base ten
$1011two = (1x2^3) +(1x2^1) +(1x2^0)$
$(1x2x2x2) + (1x2) + (1x1)$
$8 + 2 + 1$
11_{ten}

Activity
Trs' collection
Remarks

LESSON 24

Subtopic: Operations on bases
Content: Addition of same non decimal base numerals
Examples: (i) $2\ 3_{five} + 21_{five}$

$2\ 3_{five}$
$+ \quad 2\ 1_{five}$
$4\ 4_{five}$

(ii) Add: 1101 + 11two

1101two
\+ 11 two
10000 two

Activity
Trs' collection
Remarks

LESSON 25
Subtopic : Subtraction of bases
Content: Subtraction in non decimal bases in the same base.
Examples: (i) Subtract $34_{five} - 13_{five}$

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

(ii) Subtract

$$\begin{array}{r} 1011\ \text{two} \\ -\ 111\text{two} \\ \hline 0100\text{two} \\ \hline \end{array}$$

Activity
Trs' collection
Remarks

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LESSON 26
Subtopic: Multiplication in Binary system
Content: Multiply (i) 2 by 2
(ii) 3 by 2
(iii) to 4 b 3 digit numerals
Examples: (i) $10_{two} \times 11_{two}$

$$\begin{array}{r} 10_{\text{two}} \\ \times\quad 1\,1_{\text{two}} \\ \hline 1\,0 \\ +\ 100 \\ \hline 110_{\text{two}} \\ \hline\hline \end{array}$$

(ii) 11two x 11two

$$\begin{array}{r} 111_{\text{two}} \\ \times\ 11_{\text{two}} \\ \hline 111 \\ +\ 111 \\ \hline 10101_{\text{two}} \\ \hline\hline \end{array}$$

Activity
Trs' collection
Remarks

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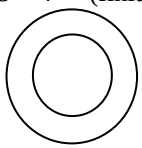
LESSON 28

Subtopic: Operations on finites
Content: Addition in finite/modular system
Examples: (i) Add: 3 + 4 = -(finite 5)
(a)



(b) 3 + 4 = - (finite 5)
3 + 4 = 7 finite 5)
7 ÷ 5 = 1 r 2
3 + 4 = 2 (finite 5)
= 2 (finite 5)
∴ 3+4 =2(finite 5)
∴ 3+4 = 2 finite 5)

(ii) 6 + 8 = y (finite 12)

Activity

Remarks

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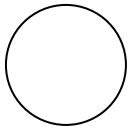
LESSON 29
SUBTOPIC: Multiplication in finite systems

Examples: (i) Work out 3 x 4 = x (finite 5)



3 x 4 means
3 groups of 4
∴ 3 x 4 = 2 (finite 5)
So x = 2 (finite 5)

(ii) 3 x 4 = x (finite 5)
3 x 4 = 12
12 ÷ 5 = 2 r 2
3 x 4 = 2 (finite 5)
∴ x = 2 (finite 5)

Activity
Ref: MK old edition pg 245-253

Remarks

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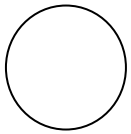
LESSON 30
Subtopic: Subtraction in finite system.

Content: (a) Using the dial
(b) By calculation method

Example: (i) Subtract 3 – 4 = - (finite 5)



∴ 3 – 4 = 4 (finite 5)

(ii) 3 – 4 = - (finite 5)
(3 + 5) – 4 (finite 5)
8 – 4 = (finite 5)
∴ 4 (finite 5)

∴ 3 – 4 = 4 (finite 5)

Activity
Mk old edition pg 245-253

Remarks

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Note: Discussing of finite using a dial
Multiplication of finite using dial.

_____

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LESSON 32

Subtopic: Algebra in finite system
Content: Solve equations in finite system
Examples: (i) Solve: p – 4 = 3 (finite 6)
P – 4 + 4 = 3 + 4 (finite 6
P + 0 = 7 (finite 6)
P = 7 ÷ 6 = 1 r 1
P = 1 (finite 6)

(ii) Find x if 2x – 3 = 3 (finite 4)
2x – 3 = 3 (finite 4)
2x – 3 + 3 = 3 + 3 (finite 4)
2x + 0 = 6 (finite 4)
$\frac{2x}{2} = \frac{6}{2}$
X = 3 (finite 4)

ii) 2x-3=4(finite 5)
2x+3+3 = 4+3 (finite 5)
2x = 7 (finite 5)
2x = 7 + 5) (finite 5)
$\frac{2x}{2} = \frac{12}{2}$ (finite 5)
X = 6 (finite 5)

Activity
Trs' collection

Remarks

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LESSON 33

Subtopic: Application of finites.

Contents: Use ideas on finites to solve everyday life problems: (weeks, months)

Examples: (a) If today is a Friday, what day of the week will it be after 23 days.
Day + 23 = - (finite 7)
5 + 23 = 28
28 ÷ 7 = 4 r 0
0 (finite 7)
∴ The day will be Sunday.

(b) If today is Friday, what day of the week was 45 days ago?
Day - 45 (finite 7)
5 - 45 6 r 3
7
5 – 3 (finite 7)
2 finite 7
∴ It was Tuesday

(c) It is April now, which month will it be after 18 months
Month – 18 (finite 12)
4 – 18 1 r 6
12
4 – 6
(4 + 12) – 6
16 – 6 = 10 (finite 120
It will be October.

Activity
MK old edition 252-253

Remarks
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REVISION WORK ON WHOLE NUMBERS

1. Given digits 8, 4, 2
   (a) Write down all the numerals you can form using the digits.
   (b) Find the difference between the highest and the lowest numeral formed.
2. Find the place value and value of the underlined digits.
   (a) 4 6657 (b) 16785 (c) 16345
3. Expand 8739 using
   (a) values (b) place values (c) Powers
4. Write 7432 in standard/ scientific form
5. Express the following in single form
   (a) 5000 + 70 + 3
   (b) (7 x 10000) + (8 x 1000) + (3 x 100) + (7 x 10) + (2 x 1)
   (c) $(7 \times 10^3) + (4 \times 10^2) + (3 \times 10^1) + 5 \times 10^0$
   (d) 8.56×10^2
6. Write 2592028 in words
7. Write: six million, eight hundred thousand, nine hundred sixteen
8. (a) Round off 4867 to the nearest tens
   (b) Round off 79581 to the nearest hundreds.
   (c) Round off 79581 to the nearest thousands.
9. Write the place value and value of the underlined digits
   (a) 0.784 (b) 3.782 (c) 5.948
10. Write 0.328 in words
11. Write Twenty seven and six tenths in figures.
12. Expand 5.78 using
    (a) place values (b) values (c) exponents
13. Express 0.432 in standard form
14. Arrange 0.44, 0.4, 4.4 in ascending order.
15. Arrange 0.35, 0.5, 0.7, 0.33 in descending order.
16. Round off 39.96 to the nearest tenth.
17. Write 99 in Roman Numerals.
18. Write XLV in Hindu Arabic system.
19. Work out: XI = IX
20. Change 26_{ten} to base six .
21. Write 346_{seven} in words.
22. Give the place value of each digit in 243_{five}.
23. Expand 462_{seven} using powers.
24. Change 341_{six} to base ten
25. Change 124_{five} to base six.
26. If $17_X = 16_{ten}$ find value of x
27. Add $55_{seven} + 33_{seven}$ = _____ seven.
28. Subtract: $44_{five} - 12_{five}$
29. Multiply $10_{two} \times 11_{two}$
30. Change 13 to finite 7.
31. Add: 4 + 4 = _____ finite 5
32. Multiply: 2 x 4 = _____ finite 5
33. Subtract: 2 – 4 = _____ finite 6
34. Divide 5 ÷ 3 = _____ finite 7
35. Solve: x – 4 = 3 finite 6
36. If today is Friday, what day of the week will it be after 22 days?
37. If today is Thursday, what day of the week was it 44 days ago?
38. It is 2.00 pm what time of the day will it be after 400 hours?

TOPIC / UNIT OPERATIONS ON NUMBERS.

LESSON 1

Subtopic: Addition of whole numbers up to millions.
Content: Adding large whole numbers up to millions with and without carrying.

Examples : (a)

```
  1 1 1 1   1 1 1
    7 8 6 4   7 6 2
+   1 9 7 9   8 6 8
  ---------------
    9 8 4 4   6 3 0
```

Example: (b) There were 246 240 books in a library and 167 645 more books were donated to the same library. How many books are these altogether?

```
    2 4 6  2 4 0
+   1 6 7  6 4 5
  ---------------
    4 1 3 8 8 5 books
```

Activity
Understanding mtc pg 40-42
Fountain pg 32-35
MK new edition pg 24-25

Remarks

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LESSON 2.
Subtopic: Subtraction of whole numbers ot millions.
Content: Subtract large numbers up to millions.

Examples: (a)

```
      4  11  12  13
      5  1  3  3    1 8 6
-     1  3  4  5    1 0 2
  ---------------------------
      3  8  8  8    0 8 4
```

.

Examples: (b) A dairy processed 6500 650 litres of milk and sold 5650945 litres. How many litres were left?

```
      6 500 650  litres
-     5 650 945 litres
  ---------------------
        849 705 litres
```

Activity
MK new edition pg 27
Fountain pg 33-34
Understanding mtc pg 43-45 .

Remarks

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LESSON 3

Subtopic: Multiplication
Content: Multiplication of large numbers
- By 2 digit number
- By 3 digit number

Examples: (i)

```
  1 4 3
x 1 8
-------
  1144
+ 1430
-------
  2574
```

Example: (b) A company has 850 workers who earn sh 5460 each a day. How much does the company spend on wages everyday?

```
    5 4 6 0
  x 8 5 0
---------
    0 0 0 0
  2 7 3 0 0
+ 4 3 6 8 0
-----------
  4 6 4 1 0 0 0
```

Activity
Fountain pg 34-36 / understanding mtc pg 46-49/ MK new edition pg 28
Remarks

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LESSON 4

Subtopic: Division

Content: Divide large numbers.
- By 2 digit
- By 3 digit

Examples: (i)

```
      152
13 ⟌ 1976
   - 13
   ----
     67
   - 65
   ----
     26
   - 26
   ----
     00
```

(ii)

```
      53
120 ⟌ 6360
   - 600
   -----
     360
   - 360
   -----
     000
```

Activity
Mk new edition pg 37-38
Fountain pg 37-38
Understanding MTCpg 49-53

Remarks

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LESSON 5

Subtopic: Division
Content: Word problems involving division of large numbers.

Example: A petrol station manger bought 2200 litres of motor oil. If she put equal amount of oil in 440 drums. How many litres of oil were in each drum?

```
      50
440 ⟌ 220000
```

- 2200
0
-0
0

Activity

Mk new edition pg 37-38
Fountain pg 37-38
Understanding MTCpg 49-53

Remarks

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LESSON 6

Subtopic: Combined operations on numbers
Content: Use of BO MAS
Examples: (i) Work out: 9 – 15 + 6
(9 + 6) – 15
15 – 15
0

(ii) 8 ÷ 4 x 3 (iii) 18 – (4 x 3) ÷ 6

~~B~~ ~~O~~ D M A S
(8 ÷ 4) x 2
2 x 2
4

iv) Kawoya got 32 mangoes in the morning and ate 28 of them .
½ of 32 was got in the evening. How many mangoes did he have at the end of the day?

Activity

Fountain pg 38-39
MK new edition pg31-32
Understanding mtc pg 54-59

Remarks

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LESSON 7

Subtopic: Properties of numbers.

Content: (i) Commutative properties
(ii) Distribution property
(iii) Associative property

Example: (i) Commutative
Order of addition or multiplication does not change the results
(a) 3 + 4 = 4 + 3 (b) 4 x 5 = 5 x 4
7 = 7 20 = 20

(ii) Associative property
Order of grouping two numbers in addition or Multiplication does not change results
e.g 3 + (8 + 9) = (3 + 8) + 9
3 + 17 = 11 + 9
20 = 20

(iii) Distribution property
e.g Work out using distributive property
(2 x 3) + (2 x 4)
2 (3 + 4)
2 (7)
2 x 7 = 14

Activity

Trs' collection

Remarks

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REVISION WEEK ON OPERATIONS ON NUMBERS

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

2. Add: 231 048 + 524 628
3. There were 351 272 books in a library and 189 242 more books were donated to the same library. How many books are there altogether?
4. Subtract: 6 4 3 2 2 7 8
   - 2 3 2 1 1 0 1
5. Subtract 452 367 from 872 291
6. A dairy processed 5300 450 litres of milk and sold 3450833 litres. How many litres were left?
7. Multiply 145 by 19?
8. Multiply 1238 by 134
9. A bus carries 84 passengers each trip. How many people will it carry if it makes 18 trips?
10. Divide 5984 ÷ 68
11. A farmer has sh 688640 to pay to 32 workers. How much money does each worker get?
12. Work out 18 – (3 x 2) ÷ 6

TOPIC / UNIT 4: PATTERNS AND SEQUENCES:

LESSON 1

Subtopic: Divisibility tests

Content:
- Divisibility tests of 2, 5, 10
- Divisibility by 3, 6, 9
- Divisibility by 4 and 8

Example: (a) By 3

A Number is divisible by 3 when the sum of its digits are a multiple of 3.

E. g 612

6 + 1 + 2

9 ÷ 3 = 3

∴ 612 is divisible by 3

(b) Divisibility by 8:

A number is divisible by 8 when the last three digits form a multiple of eight.

e.g 6248 last 3 are 248

∴ 6248 is divisible by 8

Activity

MK new edition pg 34-36
Fountain pg 41-42
Understanding pg 60-61

Remarks

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LESSON 2

Subtopic: Developing number patterns

Content:
- Odd and even numbers
- Triangular numbers
- Rectangular numbers
- square numbers

Examples: (i) Lists down the following:
(a) Counting / natural numbers less than 15.
(b) Whole numbers up to ten
(c) Even numbers between ten and 20.
(d) Odd numbers less than twenty

(ii) Triangular numbers E.g

0 → 1 0 → 3 0

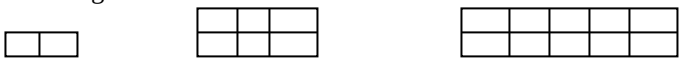
0 0 0 0

1 + 2 = 3 0 0 0

1 + 2 + 3 = 6

N.B Find triangular numbers by adding the consecutive natural numbers i. e (1, 3, 6, 10, 15, ---------)

(iii) Rectangular numbers



2 x 1 2 x 3 2 x 5

2 6 10

(iv) Square numbers

e.g 0 0 0 0 0 0 0 0 0 0

0 0 0 0 0 0 0 0 0 0

1 x 1 = 1 2 x 2 = 4 3 x 3 = 9 4 x 4 = 16

Activity

Fountain pg 43-48

MK new edition pg 37

Understanding pg 62-65

Remarks

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LESSON 3

Subtopic: Prime and composite numbers.

Content: - List prime numbers
- Composite numbers

Examples: (i) What is the sum of the 3rd and the 7th prime numbers

Prime numbers are:

2, 3, 5, 7, 11, 13, 17, 19, 23

(3rd = 5, 7th = 17)

Sum = 5 + 17

= 22

(ii) Work out the sum of the first five composite numbers

Composite numbers are;

4, 6, 8, 9, 10, 12, 14, 15,

Sum is

4 + 6 + 8 + 9 + 10 =

37

Activity

The Pupils will do exercise 4 : 13 and 4 : 14 from pgs 79 and 80. A New MK BK 6.

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Remarks

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LESSON4

Subtopic: Consecutive numbers / natural numbers / integers

Content: Find the consecutive counting numbers

Example: The sum of 3 consecutive whole numbers is 36. What are these numbers

Let the 1st number be n.

2nd number = n + 1

3rd number = n + 2

But: n + n + 1 + n + 2 = 36

n + n + n + n + 1 + 2 = 36

3n + 3 = 36

3n + 3 – 3 = 36 – 3

$\frac{3n}{3} = \frac{33}{3}$

∴ n = 11

1st number = n and n = 11	2nd number (n + 1) 11 + 1 = 12	3rd number is (n + 2) 11 + 2 13

Activity

Mk old edition pg 76-78

Remarks

LESSON5

Subtopic: Consecutive numbers
Content: Find the consecutive EVEN and ODD numbers
Example: **N.B** Even and Odd numbers increase in intervals of 2

(i) The sum of three consecutive Even numbers is 24. list down the 3 numbers

Let the 1st number by (x)

2nd number be (x + 2)

3rd number be (x + 4)

$X + x + 2 + x + 4 = 24$

$X + x + x + 2 + 4 = 24$

$3x + 6 = 24$

$3x + 6 - 6 = 24 - 6$

$\frac{3x}{3} = \frac{18}{3}$

$X = 6$

These EVEN Numbers are:

1st is 6, 2nd is , 3rd

X + 2 x + 4

6 + 2 6 + 4

8 10

Activity
MK old edition pg 77-78
Mk new edition 43

Remarks

LESSON 6

Subtopic: Factors

Content:
- Listing factors
- The common factors (CF)
- The HCF / GCF
- The LCF

Examples:

(i) How many factors does 18 have?
$F_{18} = \{1, 2, 3, 6, 9, 18\}$
$\therefore$ 18 has 6 factors

(ii) Work out the sum of all the F20
F20 = {1, 2, 4, 5, 10, 20}
Sum = 1 + 2 + 4 + 5 + 10 + 20
= 42

(iii) Work out the GCF of 12 and 18
F12 = {1, 2, 3, 4, 6, 12}
F18 = {1, 2, 3, 6, 9, 18}
CF = {1, 2, 3, 6}
GCF = 6

N.B (iv) The LCF is always 1

Activity
Mk old edition pg 81

Remarks

LESSON 7

Subtopic: Prime factorization

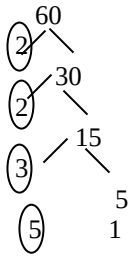
Content:
- Using (a) Multiplication
  (b) Subscript method
  (c) Powers/ exponents
- Find number prime factorised.

Examples: (i) Find the prime factors of 60.

(a) By ladder

2	60
2	30
3	15
5	5
	1

(b) by factors tree



Pf 60 are (a) $2 \times 2 \times 3 \times 5$

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

Or $2^2 \times 3^1 \times 5^1$

Activity

MK old edition pg 82

Remarks

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Lesson 8

Content:

i) Finding prime factorized number

ii) Finding the missing prime factors

examples

i) What number has been prime factorised

ii) Prime factories and find missing factors

The prime factorization f 30 is 2 x y x 5 , find y

$a = \{2_1.2_2.5_1\}$

$b = 2^2 \times 3^1 \times 5^1$

(i) If $2 \times 3 \times y = 30$ find y

$2 \times 3 \times y = 30$

$\frac{6y}{6} = \frac{30}{6}$

$y = 5$

(ii) If $144 = a^4 \times b^2$ find 'a' and 'b'

2	144
2	72
3	36
2	18
3	9
3	3
	1

$\therefore 2^4 \times 3^2 = a^4 \times b^2$

$\therefore a = 2$ and $b = 3$

(iii) Given that $2^{2x} \times 2 = 32$ find the value of x.

(1^{st} prime factorise 32)

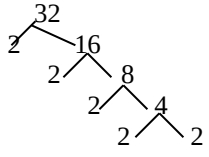
i.e $22x \times 21 = 25$

$2x + 1 = 5$

$2x + 1 - 1 = 5 - 1$

$2x = 4$

$X = 2$



Activity

Mk old edition pg 83

Remarks

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LESSON 9

Subtopic: Multiples of numbers

Content:
- Listing multiples.
- The common multiples
- The LCM

Examples: (i) List the multiples of 4 between ten and 30.

$M_4 = \{4, 8/ 12, 16, 20, 24, 28/ ----\}$

M_4 between 10 and 30 are

{12, 16, 20, 24, 28}

(ii) Work out the LCM of 24 and 36

(a) Using multiples

(b) By prime factorization method.

i.e

2	24	36
2	12	18
2	6	9
3	3	9

LCM = 2 x 2 x 2 x3 x 3

= 72

3 | 1 1

1 1

Activity
Mk old edition pg 86 .

Remarks

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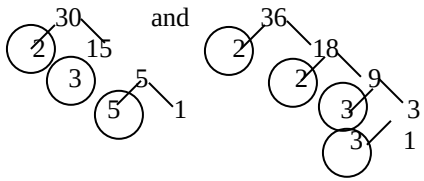
LESSON 10

Subtopic: Finding LCM and GCF by prime factorization using a venn diagram

Content:
- Representing prime factors on the venn diagrams.
- Find the GCF/HCF and LCM from the venn diagram

Examples: (i) Work out the prime factors of 30 and 36



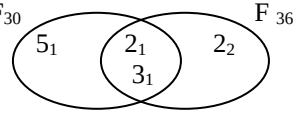
and

F_{30} $\{2_1, 3_1, 5_1\}$

$F_{36} = \{2_1, 2_2, 3_1, 3_2\}$

(ii) Complete

$F_{30} \cap F_{36} = (2_1, 3_1\}$



(iii) Use the venn diagram to find the:

(a) GCF of 30 and 36

$GCF = F_{30} \cap F_{36} = \{2_1, 3_1\}$

$= 2 \times 3 = 6$

(b) LCM of 30 and 36

$LCM = F_{30} \cup F_{36} = (2_1, 2_2, 3_1, 3_2, 5_1\}$

$= 2 \times 2 \times 3 \times 3 \times 5 = 180$

Activity
Mk old edition pg 86-87

Remarks

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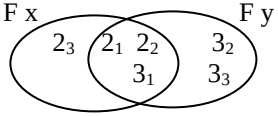
LESSON 11

Subtopic: Unknown values/ factors

Content:
(i) Find the missing number
(ii) Find the unknown factors
(iii) Work out HCF and LCM

Example: (i) Find x and y below



factors of y are
{21, 22, 31, 32, 33}
y = 2 x 2 x 3 x 3 x 3
y = 108

Factors of x = (21, 22, 31, 23}

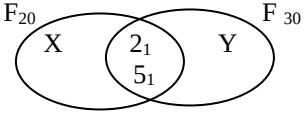
2 x 2 x 3 x 2

X = 24

$GCF = Fx \cap F y = \{2_1, 2_2, 3_1\}$
$= 2 \times 2 \times 3$
GCF = 12

$LCM = Fx \cup F y$
$= 2_1, 2_2, 2_3, 3_1, 3_2, 3_3,$
2 x 2 x 2 x 3 x 3 x 3
LCM = 216

(ii) Find the unknowns



F20 = {x, 21, 51}
20 = x + 2 x 5
20 = 10 x
10 10
2 = x
∴ x = 2_2

F30 = {21, 51, y}
30 = 2 x 5 x y
30 = 10 y
10 10
3 = y
∴ y = 3_1

GCF of 20 and 30
GCF = F20 ∩ F 30
GCF = {21, 51}
= 2 x 5
∴ GCF = 10

LCM = F 20 ∪ F 30

= {21, 22, 31, 51}
= 2 x 2 x 3 x 5
∴ LCM = 60

Activity
Mk old edition pg 88-89

Remarks

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LESSON 12

Subtopic: Application of GCF / LCM

Content:
- Relationship between GCF and LCM
- Other problem related to HCF/GCF

Examples: (i) The LCM of two numbers is 144 their GCF is 12 and one of these numbers is 48. Find the other number

Solution: Let 2nd No be y

1st No x 2nd No = LCM x GCF

$\frac{48 \times y}{48} = \frac{144 \times 42}{48}$

$y = 36$

(ii) What is the largest possible divisor of 24 and 36.
Largest possible divisor is GCF

(2)	24	36
(2)	12	18
(3)	6	9
	2	3

2 x 2 x 3 = 12

largest divisor = 12

Activity
Oxford primary MTC BK 6 pgs 34 – 41

Remarks

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LESSON 13

Subtopic: Application of LCM

Content:
- Find the smallest number which when divided by 9 and 12 leaves
  (a) No remainder?
  (b) Remainder of 1?
  (c) Remainder of 5?

Get LCM of 9 and 12 i.e

2	9	12
2	9	6
3	3	1
	1	1

LCM = 2 x 2 x 3 x 3 = 36
∴ Number is LCM + RCM
= 36 + 1 = 37

(ii) Kelvin has a stride of 40cm and his father has a stride of 60cm. What is the width of the narrowest path that they can both cross in a whole number of strides?
LCM of 40cm and 60 cm
M_{40} = {40, 80, (120), 160, ----}

M_{60} = {60, (120), 180, ---------}

LCM = 120
∴ The width is 120 cm

Activity
- Oxford primary MTC pupils BK 6 pgs 34 - 36 .

Remarks

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LESSON 14

Subtopic: Working with powers of whole numbers.

Content:
- Find a number from powers

- Express number as product of powers of a given numbers
- Operation on powers.

Example: (i) What is 7^3.

$73 = 7 \times 7 \times 7 = 343$

(ii) Express 64 using powers of fours

4	64
4	16
4	4
	1

$\therefore 64 = 4 \times 4 \times 4$

$64 = 4^3$

(iii) Work out: $23 + 32 + 50$

$(2 \times 2 \times 2) + (3 \times 3) + 1$

$8 + 9 + 1$

$= 18$

Activity

A New MK pupils' BK 6 pgs 84 and 85.

Remarks

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LESSON 15

Subtopic: Squares of numbers

Content:
- Squares of
  - (a) whole numbers
  - (b) fractions
  - (c) mixed fractions
  - (d) decimal
  - (e)

Example: (i) What is the square of 12?

$12^2 = 12 \times 12 = 144$

(ii) Work out the square of ¾

$\left(\frac{3}{4}\right)^2 = \frac{3}{4} \times \frac{3}{4} = \frac{9}{16}$

(iii) Calculate the square of 1 1 ½

$1\frac{1}{2} \times 1\frac{1}{2} = \left(\frac{1 \times 2 + 1}{2}\right) \times \left(\frac{1 \times 2 + 1}{2}\right) = \frac{3}{2} \times \frac{3}{2} = \frac{9}{4} = 2\frac{1}{4}$

(iv) Find (0.15)2

$(0.15)^2 = \frac{15}{100} = \frac{15}{100} \times \frac{15}{100} = \frac{225}{1000} = 0.0225$

(v) In general $M \times M = M^2$

Activity

- The Pupils will do exercise 9 on pg 42 from Oxford primary MTC BK 6.
- Exercise 4 : 37 pg 95, 4 : 39 pg 98 and 4 : 42 pg 101 of MK BK 6.
- Mk new edition pg 37

Remarks

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LESSON 16

Subtopic: Square roots.

Content: Square roots of whole numbers.

Example: Find the square roots of $\sqrt{36}$

2	36
2	18
3	9
3	3
	1

$\therefore \sqrt{36} = \sqrt{2 \times 2 \times 3 \times 3}$

$\sqrt{(2 \times 2) \times (3 \times 3)}$

2×3

$\therefore \sqrt{36} = 6$

(ii) Work out $\sqrt{324}$

2	324
2	162
3	81
3	27
3	9
3	3
	1

$\sqrt{324} = \sqrt{(2 \times 2) \times (3 \times 3) \times (3 \times 3)}$

$\sqrt{324} = 2 \times 3 \times 3$

$\therefore \sqrt{324} = 18$

Activity

A New MK pupils' MTC BK 6 pg 38.

Remarks

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LESSON 17

Subtopic: Square roots of fractions

Content:
- Find square roots of fractions
  - (a) Proper fractions
  - (b) Mixed numbers
  - (c) Decimals

Examples: (i) Work out the $\sqrt{\frac{4}{9}}$

$\sqrt{\frac{4}{9}} = \frac{\sqrt{2 \times 2}}{\sqrt{3 \times 3}} = \frac{2}{3}$

(ii) What is the square root $\sqrt{6\frac{1}{4}}$

$\sqrt{\frac{6 \times 4 + 1}{4}} = \frac{\sqrt{25}}{\sqrt{4}} = \frac{\sqrt{5 \times 5}}{\sqrt{2}} = \frac{5}{2} \quad 2\frac{1}{2}$

(iii) Find the square root of 1.44

$1.44 = \frac{144}{100} = \frac{\sqrt{144}}{\sqrt{100}} = \sqrt{\frac{12 \times 12}{10 \times 10}} = \frac{12}{10} = 1.2$

Activity

New MK pupils BK 6 pages 39-40

Remarks

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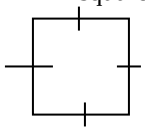
LESSON 18

Subtopic: Application of squares and square roots.

Content:
- Solve problems using square
- Solve problems involving use of square roots.

Examples: 1. A square garden has a length of 3 ½ m. What out its area.



3 ½ m

Area of sq = S x S

3 ½ m x 3 ½ m

$\frac{7}{2}$ m x $\frac{7}{2}$ m $= \frac{49}{4} m^2 = 12\frac{1}{4} m^2$

$\therefore$ Area = 12 ¼ m^2.

(ii) If a square has an area of 576.

(a) Calculate its side

Area = side x side 24 = side

576 = S x S

$\sqrt{576} = \sqrt{S^2}$ $\therefore$ side = 24

2	576
2	288
2	144
2	72
2	36
2	18
2	9
3	3

$2 \times 2 \times 2 \times 3 = \sqrt{S \times S} = \sqrt{S2}$

(b) Find the perimeter of the square.

P = 4 x side

4 x 24

$\therefore$ P = 96

Activity

The Pupils will do exercise 4 : 41 and 4 : 43 pages 100 and 102.

A old MK pupils' BK 6 pages 100 to 102.

New mk pg 39

Remarks

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LESSON 19.

Subtopic: Cubes and cube roots

Content:
- Find the cubes
- Find the cube roots

Examples: (i) What is the cube of: 5?

$5^3 = 5 \times 5 \times 5 = 125$

(ii) Find the volume of the cube below:

Vol of cube = S x S x S
V = 6cm x 6cm x 6 cm
V = 216 cm^3

(iii) Work out the cube root of

(a) 64 = 2 | 64
2 | 32
2 | 16
2 | 8
2 | 4
2 | 2
1

$\sqrt[3]{64} = \sqrt[3]{(2 \times 2 \times 2) \times (2 \times 2 \times 2)}$

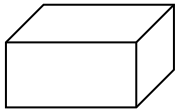
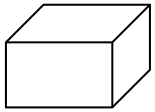
$= 2 \times 2$

$\sqrt[3]{64} = 4$

Activity

The Pupils will do exercise below

1. Work out 2^3
2. Find the number of cubes in the figure:

(a)  (b) 

3. Work out the volume of a cube of side.
   (i) side = 4cm (ii) side = 10 cm (iii) side = 5
4. Work out the cube root of each of these numbers
   (a) 8 (b) 27 (c) 64 (d) 216

Remarks

Tr's collection

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LESSON 20

Subtopic: Number patterns and sequences
Content: Complete series and sequences
Examples: Find the missing number:

(a) 2, 3, 5, 7, ___
11 is the next number
(prime numbers)

(b) 4, 9, 16, 25, _____
2 x 2 3 x 3 4 x 4 5 x 5 6 x 6
(square numbers)

(c) 1, 2, 4, 5, 7, 8, 10, 11
+1 +2, +2, +1, +2, +1, +2, +1
10 + 1 = 11

(d) 22, 16, 20, 14, 18, 12
-6, +4, -6, +4, -6
18 – 6 = 12

(e) ½ , ¼, 1/8 , _____

Activity

A New Mk primary MTC BK 6 pages 90 – 91.
Fountain pg 49

Remarks

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LESSON 21

Subtopic: Puzzles/ magic square

Content:
- Dealing with puzzles
- The magic squares:

Examples: (i) Find the missing numbers

8	X	6
3	5	Y
W	9	2

(a) Magic numbers is
8 + 5 + 2 = 15

(ii) x = 15 – (9 + 5)
X = 15 – 14
X = 1

Y = 15 – (3 + 5)
Y = 15 – 8
Y = 7

W = 15 – (8 + 3)
W = 15 – 11
W = 4

N.B Vary the squares to 16 squares.

Activity

Work on magic squares from Understanding MTC BKs 5 and 6

Understanding mtc pg 74

Remarks:

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UNIT 5: TOPIC: FRACTIONS

LESSON 1

Sub topic: Operations on fractions

Basic operations
- (i) Addition (+)
- (ii) Subtraction (-)
- (iii) Multiplication (X)
- (iv) Division (÷)
- (v) Mixed operations (BODMAS)

Content:
- (i) Addition of simple fractions with different denomination
- (ii) Addition of mixed numbers

Examples:

(i) Add: $\frac{2}{3} + \frac{1}{4}$ LCM 12

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

$$\frac{8}{12} + \frac{3}{12}$$

$$\frac{11}{12}$$

(ii) Find the sum of $2\ ^2/_3$ and $2\ ¼$

Solution:

$$2\frac{2}{3} + 2\frac{1}{4} = (2 + 2) + \frac{2}{3} + \frac{1}{4} \quad \text{LCM } 12$$

$$4 + \left(\frac{2 \times 4}{3 \times 4}\right) + \left(\frac{1 \times 3}{4 \times 3}\right)$$

$$4 + \frac{8}{12} + \frac{3}{12}$$

$$4 + \frac{11}{12}$$

$$4\frac{11}{12}$$

Activity
- Fountain pg 56-57
- Understanding pg 85

Remarks

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LESSON 2

Sub-topic: Operation on fractions

Content:
- (i) Subtraction of simple fractions with different denominations
- (ii) Subtraction of mixed numbers

Examples:

(a) Subtract: $\frac{3}{4} - \frac{3}{5}$ LCM = 20

$$\frac{15}{20} - \frac{12}{20} = \frac{3}{20}$$

(b) Subtraction: $4\frac{1}{3} \quad 1\frac{7}{8}$

$$\frac{13}{3} - \frac{15}{8} = \frac{104 - 45}{24}$$

$$= \frac{59}{24}$$

$$2\frac{11}{24}$$

Activity

Understanding mtc pg 87

Fountain pg 58-60

Remarks

LESSON 3

Sub-topic: Addition and subtraction of fractions involving word problems

Content: - Addition of fractions involving word problems
- subtraction of fractions involving word problems

Examples (a) A man used three quarters of his shamba to grow groundnuts, a half to grow potatoes and two thirds to grow water melons. Fin total fraction of the whole land used.

Solutions

$\frac{3}{4} + \frac{1}{2} + \frac{2}{3}$ LCM 12

$\frac{3 \times 3}{4 \times 3} + \frac{1 \times 6}{2 \times 6} + \frac{2 \times 4}{3 \times 4}$

$\frac{9}{12} + \frac{6}{12} + \frac{8}{12}$

$\frac{23}{12} = \frac{12}{12} + \frac{11}{12}$

$= 2\frac{11}{12}$

(b) One third of the children in a school are girls. One day a quarter of the girls in the class were absent. What fraction of the girls in the school were absent on that day?

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

Fraction of girls absent $= \frac{1}{4}$ of $\frac{1}{3} = \frac{1}{4} \times \frac{1}{3} = \frac{1}{12}$ Ans

Activity

Trs' collection

Remarks

LESSON 4

Sub-topic: Addition and subtraction

Content: Addition and subtraction by use of BODMAS

B O D M A S - subtraction
Addition
Multiplication
Division
Of
Brackets

Example: Simplify: $\frac{1}{2} - \frac{2}{3} + \frac{1}{5}$

Solution

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

Rearrange

$\frac{1}{2} + \frac{1}{5} - \frac{2}{3}$ LCM 30

$\frac{(15 + 6)}{30} - 20$

$\frac{21 - 20}{30}$

$\frac{1}{30}$

(b) Simplify: $1\frac{1}{3} + \frac{3}{4} - \frac{5}{6}$

Solution

$1\frac{1}{3} + \frac{3}{4} - \frac{5}{6}$ (Use BODMAS) LCM = 12

$\frac{4}{3} + \frac{3}{4} - \frac{5}{6}$

$\frac{16 + 9 - 10}{12}$

$\frac{25 - 10}{12} = \frac{15}{12}$

$= \frac{12}{12} + \frac{3}{\cancel{12}_4}$

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

Activity

Fountain bk 6 pg 59 .

Remarks

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LESSON 5

Sub-topic: Multiplication of fractions

Content:
- Multiplication of fractions
- Multiplication of simple fractions

Examples: Fraction with whole number.

(i) $\frac{1}{3} \times 12 = \frac{1}{3} \times \frac{12}{1}$

$= \frac{\cancel{12}^{4}}{\cancel{3}_{1}} = 9$

calculate $\frac{3}{4}$ of 12

$\frac{3}{4}$ of $25 \quad \frac{3}{4} \times \frac{12}{1}$

$= \frac{\cancel{36}^{9}}{\cancel{7}_{1}}$

(b) Fraction by fractions

Multiply: $\frac{2}{5} \times \frac{3}{4}$

$\frac{2 \times 3}{5 \times 4} = \frac{\cancel{6}}{\cancel{20}} \frac{3}{10}$

$= \frac{3}{10}$

(c) Multiply: $\frac{1}{2} \times \frac{1}{3}$

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

Activity

Fountain pg 60-61

Understanding mtc pg 79-81

New Mk pg 46-47

Remarks

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LESSON 5

Sub-topic: Operation on fractions

Content: Division of fractions
- (i) Use of LCM
- (ii) Use of reciprocal

Reciprocals

Product of a number by its reciprocal is 1.

What is the reciprocal of ¾ ?

Let the reciprocal of ¾ be t.

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

$= \frac{\cancel{4}^{1}}{} \times \frac{3t}{4} = 1 \times 4$

$= \frac{\cancel{3}^{1}t}{\cancel{3}_{1}} = \frac{4}{3}$

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

∴ Reciprocal of ¾ is $^{4}/_{3}$

What is the reciprocal of 2 ¼ ?

Let the reciprocal of 2 ¼ be y.

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

$\frac{9}{4} \times y = 1$

$\frac{9y}{4} = 1 \times 4$

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

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

∴ Reciprocal of 2 ¼ is $\frac{4}{9}$

Activity

Old edition MK pg 48

Remarks

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Email: tekule@tekartlearning.com

LESSON 6

Sub-topic: division of fractions

Content:
- Divide fractions using reciprocals
- Divide fractions using LCM

Examples: (i) Divide $\frac{2}{3} \div 2$

$\frac{2}{3} \div \frac{1}{2}$ Reciprocal of $\frac{2}{1}$ is $\frac{1}{2}$

$\frac{2}{3} \times \frac{1}{2} = \frac{\cancel{2}^{1}}{\cancel{6}_{3}} = \frac{1}{3}$

(b) Divide: $2 \div \frac{2}{3}$

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

$\frac{\cancel{3}^{1}}{\cancel{3}_{1}} \times \frac{2}{} \div \frac{2}{1} \times 3$

$2 \div 6.$

$\frac{\cancel{2}^{1}}{\cancel{6}_{3}} = \frac{1}{3}$

Activity
New MK BK 6.

Remarks

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Examples (ii) (a) Divide: $\frac{3}{4} \div \frac{1}{2}$

LCM

$\frac{3}{4} \div \frac{1}{2}$ LCM 4

$\frac{\cancel{4}^{1}}{\cancel{4}_{1}} \times \frac{3}{} \div \frac{1}{2_1} \times \frac{4^{2}}{}$

$3 \div 2$

$3 = 1\ ½$

Reciprocal

$\frac{3}{4} \div \frac{1}{2}$ reciprocal $\frac{2}{1}$

$\frac{3}{4} \times \frac{2}{1}$

$\frac{3}{4} \times \frac{2}{1} = \frac{\cancel{6}^{3}}{\cancel{4}_{2}}$

$1\ ½$

(b) Divide $2\ ½ \div 1\ ¼$

LCM

$2\ ½ \div 1\ ¼$

Reciprocal

$2\ ½ \div 1\ ¼$

$\frac{5}{2} \div \frac{5}{4}$ LCM 4

$\frac{\cancel{4}^{2}}{\cancel{2}_{1}} \times \frac{5}{} \div \frac{5}{\cancel{4}_{1}} \times \frac{\cancel{4}^{1}}{}$

$(2 \times 5) \div 5$

$10 \div 5 = 2$

$\frac{5}{2} \div \frac{5}{4}$ Reciprocal 4

$\frac{5}{2} \times \frac{4}{5}$

$\frac{20}{10} = 2$

Activity
New MK pg 50
Fountain pg 62-64 .

Remarks

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LESSON 7

Sub-topic: Operation on fractions

Content: Mixed operations with fractions

(i) Use of BODMAS

B	-	Brackets	( )
O	-	Of	of
D	-	Division	÷
M	-	Multiplication	X
A	-	Addition	+
S	-	Subtraction	-

Examples: 1. Simplify: $\frac{5}{6} - \frac{3}{4} \div 1\ ½$

Rename $1\ ½$ to $^{3}/_{2}$

$\frac{5}{6} - \left(\frac{3}{4} \div \frac{3}{2}\right)$ BODMAS

$\frac{5}{6} - \left(\frac{\cancel{3}^{1}}{4_2} \times \frac{2^{1}}{\cancel{3}_{1}}\right)$

$\frac{5}{6} - \frac{1}{2}$ LCM = 12

$\frac{10 - 6}{12} = \frac{4}{12}$ (1, 3)

$= \frac{1}{3}$

Activity
Fountain pg 64-66
New mk pg 51
Old mk pg 113

Remarks
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LESSON 8

Sub-topic: Decimals

Content: 1. Addition of decimal up to ten thousandths with carrying
2. Addition of decimals up to ten thousandths with carrying.

Examples (a)
(i) Add: 1. 5 + 0.4 (ii) 7.04 + 1.6 (ii) Add 2.4 + 0.254

1. 5	7. 04	2. 4
+ 0. 4	+ 1. 6	+ 0. 254
1. 9	8. 64	2. 654

(b)
(i) Add; 1. 5 + 1.6 (ii) Add 0.09 + 0.18 (iii) Add 0.067 +0.057

1	1	11
1.5	0.09	0.067
+ 1.6	+ 0.08	+ 0.057
3.1	0.27	0.124

Content: -Subtraction of decimals up to ten thousandths without carrying.
- Subtraction of decimals up to ten thousandths with carrying.

Examples (a)
(i) Subtract: 2.5 – 1.3 (ii) Subtract: 0.9 – 0.4 (iii) Subtraction 2.085 – 0.03

2.5	0.98	2.085
- 1.3	- 0.4	- 0.03
1.2	0.58	2.602

Example (b)
(i) Subtract 2.8 - 0.9 (ii) Subtract 1.45 – 0.6 (iii) Subtract 2.7 – 0.098

1	0	6 9
~~2~~.18	~~1~~.45	2.~~7~~ ~~10~~ 10
- 0.9	- 0.6	- 0.0 9 8
1.9	0.85	2.6 0 2

Activity
Understanding mtc pg 91-93
MK old Mk pg 114

LESSON 9

Subtopic: Decimals

Content: Addition and subtraction of decimals (consolidated)

Examples (a) 8 – 5.16 + 2.13
(8 + 2.13) – 5.16

	9 10
8. 0 0	~~10~~. ~~1~~ 13 = 4.97
+ 2 . 1 3	- 5. 1 6
10. 1 3	4 . 9 7

(b) 7 . (0.45 + 1.71)

	6 9	
1. 7 1	7. 10 10	= 4.84
+ 0. 4 5	- 2. 1 6	
2. 1 6	4. 8 4	

(c) (1.306 – 1.1) + 1.067

```
   1. 306        0.206
 _ 1. 1        + 1. 067      = 1.273
   0. 206        1. 273
```

(c) 3.64 + 5 – 2.42

```
   3. 6 4          8. 6 4
+  5. 00        -  2. 42     = 6. 22
   8. 64           6. 22
```

Word problems involving addition and subtraction of decimals.

Example: (d) Mariko bought 4 . 5 litres of milk. If 0.35 litres got spilled. How many litres were left?

```
     4
   4. 5 10
-  0. 3 5
   4. 1 5
```

4. 15 litres were left.

(e) In a Ludo game. Okello scored 7. 5 points in the first round and 3. 8 points in the second round. How many points did he score altogether?

```
1st round     7. 5
2nd round   + 3. 8
           11. 3
```

He scored 11.3 points altogether.

Activity
Old edition Mk pg 115-116
Fountain pg 71

Remarks

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LESSON 10

Subtopic: Decimals

Content:
- Multiplication of a decimal by decimal
- Multiplication of a decimal by a whole number and vice versa.

Example (a) (i) Multiply: 0.9 x 0.5

Method I

```
   0. 9   ← 1 dp
 x 0. 5   ← 1 dp
   4 5
 + 0 0
   0. 45  ← 2 dp
```

Method 2

$\frac{9}{10} \times \frac{5}{10}$

$= \frac{45}{100}$

$= 0.45$

(a) (ii) Multiply 1. 32 x 2.4

Method 1

```
   1. 32  ← 2 dp
 x 2. 4   ← 1 dp
   5 2 8
+ 2 6 4
  3.1 6 8 ← 3 dp
```

Method 2

$\frac{132}{100} \times \frac{24}{10}$

$= \frac{3168}{1000}$

$= 3.168$

(b) Multiply: 1.4 x 25

Method 1

```
   25   ← 1 dp
 x 1. 4 ← 1 dp
   10 0
+ 25
  35.0  ← 1 dp
```

Method 2

$\frac{14}{10} \times \frac{25}{1}$

$= \frac{350}{10}$

$= 35$

Activity
Old edition MK pg 116-118
Fountain pg 72
New mk pg 58-60

Remarks

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LESSON 11

Subtopic: division of decimals
Content: division by decimals
Division by whole numbers

Example: (a) Divide 8 ÷ 0.02

Method 1

$\frac{8}{} \times \frac{100}{}$

Method 2

$8 \div \frac{2}{}$

$0.02 \times 100 = \frac{800}{2} = 400$ $\qquad$ $\frac{8}{1} \times \frac{100}{2} = 400$

(b) Divide: $0.02 \div 8$

Method 1

$\frac{0.02}{8} \times \frac{100}{100} = \frac{2}{800} = \frac{1}{400}$

Method 2

$\frac{2}{100} \div \frac{8}{1} = \frac{2}{100} \times \frac{1}{8} = \frac{2}{800} = \frac{1}{400}$

Example: (c) Divide: $2.4 \div 0.03$

Method 1

$\frac{2.4}{0.03} \times \frac{100}{100} = \frac{240}{3} = 80$

Method 2

$\frac{24}{10} \div \frac{3}{100} = \frac{24}{10} \times \frac{100}{3} = 80$

(d) Divide: $0.072 \div 0.8$

Method 1

$\frac{0.072}{0.8} \times \frac{1000}{1000} = \frac{72}{800} = \frac{9}{100} = 0.09$

Method 2

$\frac{72}{1000} \div \frac{8}{10} = \frac{72}{1000} \times \frac{10}{8} = \frac{9}{100} = 0.09$

Activity
New MK pg 61-65
Fountain pg 73-74
Understanding pg 97-98

Remarks

LESSON 12
Subtopic: Decimals
Content: Consolidation of all operation on decimals
Example: 1. Work out: $\frac{0.7 \times 0.6}{0.3}$

Method 1

$\frac{0.7 \times 0.6}{0.3} \times \frac{100}{100} = \frac{42}{30} = \frac{14}{10} = 1.4$

Method 2

$\left(\frac{7}{10} \times \frac{6}{10}\right) \div \frac{3}{10} = \frac{7}{10} \times \frac{6}{10} \times \frac{10}{3} = \frac{14}{10} = 1.4$

2. Work out: 35×0.5

Method 1

$\frac{35 \times 0.5}{0.05} \times \frac{100}{100} = \frac{35}{5} \times 50 = 350$

Method 2

$\frac{35}{1} \times \frac{5}{10} \div \frac{5}{100} = \frac{35}{1} \times \frac{5}{10} \times \frac{100}{5} = 350$

Activity
Old MK pg 121
Fountain pg 64-65
Understanding pg 73

Remarks

LESSON 13
Subtopic: Decimals
Content: Word problems involving multiplication and division of decimals.

Example: (a) The length of one side of a square is 8.75 cm.
What is the perimeter of the square.

Method 1
Perimeter of square = 4S
= 4 x 8.75

8.75
X 4
35.00
The perimeter is 35 cm

Method 2
P = 4S
= 4 x 875/100
= 3500/100
= 35 cm

(b) A parcel weighing 5.5 kg contains packets of salt. How many packets of salt are in the parcel if each packet weighs 0.25 kg.

Method 1 No of packets = total weight / Weight of one packet
= 5.5 ÷ 0.25
Either 5.5 x 100 / 0.25 x 100 = 550/25 = 22
There are 22 packets

OR 55/10 ÷ 25/100
55/10 x 100/25 = 22 packets

Activity
New Mk pg 65
Old MK pg 118
Understanding mtc pg 98

Remarks

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TERM II

TOPIC : RATIOS AND PROPORTIONS

LESSON 14

Subtopic: Ratios

Content: (i) Form rations

Examples: Ratios are away of comparing similar quantities.
4kg and 5 kg
Mass first quantity / Mass second quantity = 4/5
Ratios = 4.5

(b) Express 40cm to 2m as a ratio.
Compare quantities
40 cm to 2m
Must be in same units
1m = 100 cm
2 m = 2 x 10 cm
= 200 cm
40 cm to 200 cm
Ration 40/10 : 200/10
4/4 : 20/4
1 : 5

(c) Write 1 to 1 as a ratio
3 4
LCM = 12 of fractions
1/3 x 12/1 : 1/4 x 12/1
1 3
4 : 3
ratio 4 : 3

Activity
New MK pg 66
Remarks

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LESSON 15

Subtopic: Rations

Content: (i) Expressing rations as fractions
(ii) Expressing fractions as ratios
(iii) Expressing quantities as ratios

Examples: (a) Express 1 : 2 as a fraction
Solution
1 : 2 = 1/2 Ans

(b) Express 1 as a ratio

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

(c) Henry has 12 books and John has 20 books.
What is the ratio of Henry's books to John's books?
Solution

Henry's	to	John's
12	to	20
$\frac{\cancel{12}^{3}}{\cancel{4}_{1}}$	:	$\frac{\cancel{20}^{5}}{4_{1}}$

3 : 5

NOTE: Ratios must be simplified to its lowest terms

Activity
New MK pg 67
Fountain 77-78
Remarks

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LESSON 16

Subtopic: Ratios

Content: Sharing in ratios

Examples: (i) John and Mary share 27 sweets in the ratio 4 : 5. How many sweets does each get?
Ratios: John : Mary
4 : 5
John's share: $\frac{4}{\cancel{9}_{1}} \times \cancel{27}^{3}$ sweets
4 x 3 sweets
12 sweets

(ii) A Man and his wife had 200 kg of coffee. They decided to share it in a ratio of 7 : 3 respectively.
(i) How many kg did the man get?
M : W
7 : 3
Total ratio = 7 + 3 = 10
Man's share $\frac{7}{10} \times 200$ kg
= 140 kg

(ii) How many kg did the wife get?
$\frac{3}{10} \times 200$ OR 200 - 140
60 kg 60 kg

Example: (iii) A sum of shs 30000 was shared by three brothers Amos, Andrew and Allan in a ratio of 1 : 2 : 3 respectively. How much did each get?
Total ratio = 1 + 2 + 3
= 6
Ratios by names: Amos : Andrew : Allan
Ratio 1 : 2 : 3

Amos = $\frac{1}{\cancel{6}_{1}} \times \frac{5000}{\cancel{30{,}000}}$
= Shs 5000

Andrew = $\frac{2}{\cancel{6}_{1}} \times \frac{5000}{\cancel{30{,}000}}$
= Shs 10000

Allan = $\frac{3}{\cancel{6}_{1}} \times \frac{5000}{\cancel{30{,}000}}$
= Shs 15000

Activity
fountain pg 80-81/ old MK pg 133-135
Remarks

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LESSON 17
Subtopic: Ratios
Content: Finding numbers when ratios are given
Example: The ratio of boys to girls in a class is 1 : 2. If there are 14 boys, how many pupils are in the class?
Solution
Expressing ratios in terms of t.

B	G	Total
T	2t	3t
14		

t = 14
Total = 3t
= 3 x t
= 3 x t
= 3 x 14
= 42

∴ There are 42 pupils in the class

Activity
Old MK pg 135

Remarks

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LESSON 18

Subtopic: Ratios

Content:
- Increasing in a given ratio
- Decreasing in a given ratio

Examples:

(a) The prize of an article is increased from shs 1200 in a ratio 3 : 2. Find the new prize.

Solution.

$\frac{3}{\cancel{2}}$ x $\frac{\cancel{1200}}{1}$ 600

= 1800/=

(b) The prize of an article costing shs 2500 was reduced in the ratio 5 : 8. Find the new prize.

Solution

$\frac{5}{\cancel{8}}$ x $\frac{\cancel{25\,000}}{3145}$ 1

Shs 15625

Activity
Old MK pg 129-131
Fountain pg 79-80

Remarks

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LESSON 19

Subtopic: Ratios

Content:
- Finding the ratio of increase
- Finding the ratio of decrease

Examples:

(a) A man's salary was shs 10000. it has been increased to shs 12000 in what ratio has it increased ?

New salary = shs 12000
Old salary = shs 10000

Increased ratio = $\frac{\cancel{12}\,\cancel{000}}{\cancel{10}\,\cancel{000}}$ 6 / 5

Ratio increased = 6 : 5

(b) A bag had 40 sweets, 12 more sweets were added.

(i) How many sweets are in the bag now?
40 + 12 = 52 sweets

(ii) In what ratio have the sweets increased

Increase in ratio = $\frac{\text{New No}}{\text{Old No}}$

= $\frac{\cancel{52}}{\cancel{40}}$ $\begin{matrix}13\\10\end{matrix}$

Ratio increase = 13: 10

Content: Finding the ratio of decrease

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

New No 35
Old No 40

Decrease in ratio = $\frac{\text{New No}}{\text{Old No}}$

= $\frac{\cancel{35}}{\cancel{40}}$ $\begin{matrix}7\\8\end{matrix}$

Ratio of decrease 7 : 8

A school had 1200 pupils. This year the number has decreased to 1000 pupils. In what ratio has the number decreased?

New No = 1000
Old No = 1200

Increase = New No / Old No / 5

$= \frac{\cancel{10}\,\cancel{00}}{\cancel{12}\,\cancel{00}} / 6$

Ratio of decrease 5 : 6

Activity
Old MK pg 132

Remarks

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LESSON 19

Subtopic: Ratios
Content: Application of ratios in solving daily life situations
Examples: Mary and John have oranges in the ratio of 2 : 3 respectively. If Mary has 10 oranges, how many oranges does John have?
Solution
Mary to John
2 : 3
Mary's oranges 10
2 parts represents 10 oranges
1 part represents $\frac{10}{2}$ oranges
3 part represents $\frac{\cancel{10}^{5}}{\cancel{2}_{1}} \times 3$ oranges
= 5 oranges

Activity
Old MK pg 135

Remarks

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LESSON 20

Subtopic: Proportions

Content: (i) Direct proportions
(ii) Constant proportionality

Example (i) One pen costs 200/=. What is the cost of 5 pens?

Method 1
1 pen costs 200/=
∴ 5 pens cost (200 x 5)/=
= 1000/=

New ratio : 0ld ratio
5 : 1
? : 200
1 part = 200
5 parts = (200 x 5)/= 1000/=

Example (b) 4 pens cost 2000/=. What is the cost of 7 pens?
4 pens cost 2000/=
500
1 pen costs $\frac{\cancel{2000}}{4}$ = 500
7 pens cost 500 x 7 = 3500/=

New : old 1 part = $\frac{2000}{4}$
7 : 4
? : 2000 7 parts = 500 x 7
4 parts = 2000 = 3500/=

Example (c) 1800/= can buy 2 kg of sugar. How many kg of sugar can one get with 3600/=?
1800/= can buy 2 kg
1/= can buy $\left(\frac{2}{1800}\right)$ kg
∴ 3600/= can buy $\frac{2}{\cancel{1800}_{1}} \times \frac{\cancel{3600}^{2}}{} = 4$kg of sugar

Example (d) In constant proportionality, one quantity increases in the same proportion as the other. E.g With a moving body, or car in a given distance, it takes 2 hours to carry 30 people, and takes the same time to carry 10 people through the same distance;

Activity
Fountain pg 82-83
Old MK pg 136-137

Remarks

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LESSON 21

Subtopic: Proportions

Content: Indirect/ Inverse proportion

Example (a) 3 men can do a piece of work in 6 days. How long will 9 men take to do the same piece of work at the same rate?

MEN	DAYS
3 men take	6 days
1 man takes	(6 x 3) days
9 men take	$\frac{\cancel{6}^{2} \times \cancel{3}^{1}}{\cancel{9}\ \cancel{3}_{1}} = 2$ days

(b) 2 children can dig a garden in 8 days. How many children will dig the same garden in 4 days?

DAYS	CHILDREN
In 8 days it requires	2 children
In 1 day it requires	(2 x 8) children
In 4 days it requires	$\left(\frac{2 \times 8^{2}}{4_{1}}\right) = 4$ children

(c) A car moving at a speed of 80km/hr takes 3 hours to cover a certain journey. How long will the car take if it moves at a speed of 120km/hr for the same journey?

	SPEED	TIME
	At 80km/hr the car takes	3 hours
	At 1/km/hr the car takes	(3 x 80) hrs
∴	At 120km/hr the car take	$\frac{\cancel{3}^{1} \times \cancel{80}^{2}}{\cancel{120}\ \cancel{40}_{1}} = 2$ hrs

Activity

Fountain pg 82-83

New MK pg 71

Remarks

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LESSON 22

Subtopic: Percentages

Content:
- Meaning of percentage
- percentage as fractions
- Fractions as percentages

Examples: (i) Express as fractions

(a) $5\% = \frac{5}{100} = \frac{1}{20}$

(b) $15\% = \frac{15}{100} = \frac{3}{20}$

(c) $33\ ^{1}/_{3}\% = \left(\frac{100}{3}\right)\% = \left(\frac{100}{3} \div \frac{100}{1}\right)$

$= \left(\frac{100}{3} \times \frac{1}{100}\right) = \frac{100}{300} = \frac{1}{3}$

(ii) Fractions as percentages

(a) $\frac{4}{5} = \left(\frac{4}{5} \times 100\right)\% = \frac{400}{5}\% = 80\%$

(b) $\frac{2}{3} = \left(\frac{2}{3} \times 100\right)\% = \frac{200}{3}\% = 66\ ^{2}/_{3}\%$

Activity

New MK pg 72-74

Understanding mtc pg 113

Remarks

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LESSON23

Subtopic: Decimals as percentages.

Content:
- Express decimals as percentages
- Change percentages to decimal

Examples: (i) Convert 0.6 to percentage

0.6 = 6

$\frac{6}{10} \times 100\% = \frac{6}{10} \times 100\ \% = \frac{600}{10}\ \% = 60\%$

(ii) What is 2.8 as a percentage?

$2.8 = \frac{28}{10}$

$\left(\frac{28}{10} \times 100\right)\% = \left(\frac{28}{10} \times \frac{100}{1}\right)\% = 28\%$

(iii) Express 0.014 as percentage

$0.014 = \frac{14}{1000}$

$\left(\frac{14}{1000} \times 100\right)\% = \frac{1400}{1000}\ \% = 1.4\ \%$

(iv) Change 2.5% to decimal

$2.5 = \left(\frac{25}{100}\right)\% = \left(\frac{25}{100} \div \frac{100}{1}\right) = \frac{25}{100} \times \frac{1}{100}$

$\frac{25}{1000} = 0.0025$

LESSON 24

Subtopic: Ratios as percentages.

Content:
- Express ratios as fraction
- Change ratios to percentages
- Percentages as ratios

Examples: (i) Express the following as percentages

(a) 1 : 2

$1 : 2 = \frac{1}{2} \times 100\ \% = \left(\frac{100}{2}\right)\% = 50\%$

(b) $3 : 8 = \frac{3}{8}$

$\therefore \frac{3}{8} \times 100\ \% = \frac{300}{8}\ \% = 37\frac{4}{8}\% = 37\ ½\ \%$

(ii) Percentage as ratios

e.g Express 60% as a ratio

$60\% = \frac{60}{100} = \frac{6}{10} = \frac{3}{5}$ 3.5

$\therefore$ 60% = 3 : 5

Activity
Understanding mtc pg 115-116
Old MK pg 145
New MK pg 75
The
Remarks

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LESSON 25

Subtopic: Find parts of percentages

Content: Find part represented by a given percentage

Example: (a) If 80% of a class are boys
What percentage are girls
Class = 100%
Boys = 80%
Girls = (100 – 80) %
Girls = 20%

(b) If a man covers 30% of the journey by car and 50% by bus.
What percentage of the journey is left?
Total journey = 100%
Covered = (30 + 50) % = 80%
Journey left = 100% - 80%
= 20%

Activity
Understanding mtc pg 117
Remarks

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LESSON26

Subtopic: Quantities as percentages

Content: expressing quantities as percentages.

Examples: A (i) There are 40 goats on a farm and 15 are sold. Find the %age number of goats.

(a) sold = 15 out 40 = $\frac{15}{40}$

$\left(\frac{15}{40} \times 100\right)$ % = $\frac{1500}{40}$ = 37 ½ %

(b) not sold: = 40 1-15 = 25

$\left(\frac{25}{40} \times 100\right)$ % = $\frac{2500}{40}$ = 62 ½ %

Examples: B (i) What is 20% of sh 2500/=

20 % of 2500 = 20 x $\frac{2500}{100}$

20 x 25

= sh 500

Activity
New MK pg 77
Old MK pg 150
Understanding mtc pg 117
Remarks

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LESSON 27

Subtopic: Expressing a quantity as percentage of the other

Content: Find one quantity as percentage of another given quantity

Examples: (i) In a school of 400 pupils. Boys are 30 of the total

(a) Express the boys as a percentage of the school

$\frac{\text{boys}}{\text{school}} = \frac{300}{400} \times 100\% = 300\% = 75\%$

(b) Express 500g as a percentage of 1 kg

1 kg = 1000g

500 g = 500g

1 kg 1000g

In percentage

$\frac{500}{1000} \times 100\% = 50\%$

Activity
Understanding mtc pg 117
Remarks

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LESSON 26

Subtopic: Sharing quantities using percentage

Content: Share quantities using given percentages.

Examples: (a) If a school has 400 pupils, 30% are boys. How many boys are there in the school?

School = 400 pupils

Boys = 30% of total

Number of boys = 30% of 400

$\frac{30 \times 400}{100}$ = 120 boys

(b) How many are girls?

No of girls = (400 – 120)

= 280

Activity
Old MK pg 151
Remarks

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LESSON 46

Subtopic: Algebra in percentages

Content: Forming and solving equations involving percentages

Examples: (i) If 10% of a number is 40. find its number

Let this number be x.

But 10% of x = 40

$10 \times \frac{X}{100} = 40$

$\frac{X \times \cancel{10}}{\cancel{10}} = 40 \times 10$

$X = 400$

(ii) If 20% of the school are girls. there are 35 girls in the school. How many pupils are there in the school.

Method 1

Let the total = y

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

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

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

$\frac{2}{2} y = \frac{350}{2}$

Y = 175 pupils

method II

If 20% of the number = 35

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

100% of the number = 15

$\frac{35}{20} \times 100 = 35 \times 5$

$35 \times 100 = 35 \times 5$

20

The number = 175

Activity

Olf MK pg 152-153

Remarks

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LESSON 28

Subtopic: Increase in percentages

Content: (i) Increase in and decrease in percentage
(ii) Word problems involving increase in percentages

Examples. (i) Increase 800 by 5%

(100% + given %) of old value

(100% + 5%) of 800

105% of 800 = $\frac{105}{100} \times 800$

= 840

(ii) The number of children in a school of last year was 400. this year the number increased by 15%. What is the number of pupils in the school this year?

New number = (100% + 15%) of original number

$= \frac{115}{100} \times 400$

$= 115 \times 4$

New number = 460 pupils.

Activity

Fountain pg 85

Understanding mtc pg 121

Remarks

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LESSON 29

Subtopic: Decrease in percentage

Content: Decrease in percentage

Examples: (i) Decrease 900 litres of water by 10%

(100 – 10)% of original value

90% of 900 = $\frac{90}{100} \times 90 = 810$ litres

(ii) Byansi had 180 cows. He sold 15% of them. How many cows remained

(100 = 15)% = 85%

85% of 180 cows = $\frac{85}{100} \times 180 = 153$ cow

∴ 153 cows remained

(iii) A man's salary is $ 800. How much will his salary be if it is cut by 12 ½ %

(100 – 15) % = 85%

Method

87 ½ % of 800 = $\left(\frac{175}{1} \times \frac{1}{100}\right) \times 800$

$\frac{175}{200} \times 800 = \frac{1400}{2} = 700$

= $ 700

Activity
Ne Mk pg 80
Old MK pg 133-136
Fountain pg 85

Remarks
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LESSON 30

Subtopic: Percentage profit / loss

Content:
- Find the percentage profit.
- Find the percentage loss.

Example: (i) A trader bought 1600/= and sold it at 2000/=

(a) Find the profit he made

Profit = Sp – Cp

(2000 – 1600) =

∴ profit = 400/=

(b) Work out the percentage profit

%age profit = $\frac{\text{profit}}{\text{C. price}} \times 100\%$

$= \left(\frac{400}{1600} \times 100\right)\%$

∴ profit = 25%

(ii) Mulema bought a goat at 35,000= and sold it at sh 32,000=

(a) Find the loss.

Loss = Cost price – selling price

35000 - 32000

700/=

(b) Calculate the percentage loss

% loss = $\left(\frac{\text{loss} \times 100\%}{\text{c.p}}\right) = \frac{700}{350} \times 100\% = 20\ \%$

∴ Loss = 20%

Activity
Fountain pg 86-87

Understanding pg 123-124

Remarks
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LESSON 31

Subtopic: Simple interest and amount

Content:
- Calculate the simple interest with emphasis on time in
  (i) years
  (ii) months

S.I = principal x time x rate i.e $P \times T \times R$

$= 15\cancel{00} \times 3 \times \frac{8}{1\cancel{00}}$

S.I = 3,600/=

(ii) Work out the simple interest offered to Tom who deposited 48000/= in a bank at an interest rate of 15% for 6 months.

S.I = P x T x R i.e P = 48000/=

T = 6 months = $^{6}/_{12}$

R = 15 % = $\frac{15}{100}$

$\overset{240}{48\cancel{000}} \times \frac{\cancel{6}^{1}}{\cancel{12}_{2}} \times \frac{15}{1\cancel{00}}$

240 x 15

S.I = 3600/=

(iii) Find the simple interest on 12000/ at a rate of 10% per year for 2 ½ years.

(a) $S.I = P \times T \times \frac{R}{100} = 12000 \times 2\frac{1}{2} \times \frac{10}{100}$

$= \cancel{1200} \times \frac{5}{2} \times 1$

= SI 600 x 5 = 3000/=

(b) How much money will it be after 2 ½ years

Amount = S I + P = 12000

+ 3000

15,000

Activity
Fountain pg 88

New Mk pg 83
Understanding pg 126-127

Remarks

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Exercise 01 Revision questions on fractions

1. Change $\frac{5}{2}$ to a mixed number.
2. What is 1 ½ as an improper fraction.
3. (a) Reduce $\frac{6}{9}$ to its lowest terms.
   (b) Reduce $\frac{48}{108}$ to its lowest terms
4. Change (a) ¾ to a decimal fraction (b) 2 ¼ to a decimal fraction.
5. Convert (a) 0.25 to a common fraction
   (b) 1.25 to a common fraction.
6. Change $^2/_3$ to a decimal fractions
7. What is 0.333—as a common fractions
8. Change (a) 0.3636 (b) 0.2727 to common fractions.
9. Write (a) 0.122 ------- (b) 0.24555--- to common fractions
10. Arrange the following fractions in ascending order.
    (a) $\frac{1}{4}, \frac{1}{6}, \frac{1}{2}, \frac{1}{3}$ (b) $\frac{3}{5}, \frac{5}{6}, \frac{1}{5}, \frac{2}{3}$
11. Arrange the following fractions in descending order.
    (a) $\frac{2}{5}, \frac{5}{12}, \frac{5}{6}$, (b) $\frac{3}{4}, \frac{2}{3}, \frac{1}{6}$
12. Add: (a) $\frac{3}{8} + \frac{1}{4}$ (b) $1\ ^2/_2 + 2\ ¼$
13. (a) What is the sum of a quarter and a third?
    Moses bought a half litre of milk and later bought three quarter litres of milk because the milk was not enough. How much milk did he buy altogether?

Exercise 02 Revision Exercises on Fractions

1. Subtract: (a) $\frac{1}{2} - \frac{1}{4}$ (b) 2 ½ - 1 ¾
   (c) 1 - ¾
   (c) $\frac{5}{6} - \frac{3}{8}$ (d) 3 ¼ - 1 2/3
2. (a) What is the difference between three – quarters and a half
   (b) Subtract a quarter from ½
3. A farmer uses a half of his shamba for tomatoes, $^2/_3$ to grow onions
   (a) How much land does he use for farming?
   (b) How much land remained unused?
4. A quarter of the pupils in my class are girls. one day ½ of the girls number didn't attend lessons. What fraction of the girls was absent.
5. Simplify: (a) $\frac{1}{4} - \frac{1}{2} + \frac{2}{3}$ (b) $\frac{2}{5} + \frac{1}{3} - \frac{2}{3}$
   (c) $\frac{1}{3} + \frac{1}{6} + \frac{4}{4}$
6. Find the value of $2\ ¼ - \frac{2}{3} - \frac{5}{6}$
7. Work out (a) $4 \div {}^1/_3$ (b) $^3/_8 \div 6$
8. Simplify: (a) $\frac{3}{4} \div \frac{3}{5}$ (b) $3\ ^1/_8 \div 3\ ¾$
9. Work out $4\ ^1/_5 \div (1\ ^1/_6 + 2\ ^1/_3)$
10. Simplify: $(2\ ½ + {}^5/_6) \div 1\ ^2/_3$
11. Find the value of $1\ ½ - 2\ ^1/_3 + 1\ ¼$
12. Work out (a) $\frac{1}{2} + \frac{1}{4} \div \frac{1}{3}$ (c) $\frac{5}{6} \div \frac{2}{3} - \frac{1}{2} \times \frac{1}{3}$
    (b) $\frac{2}{3} - \frac{1}{2}$ of $\frac{1}{3}$ (d) $\frac{3}{4}$ of $\frac{4}{5} - \frac{1}{6} \div \frac{1}{2}$
    (e) $\frac{1}{3} \div \frac{1}{2}$ of $\frac{2}{3}$
13. A club spent a quarter of its earnings and saved the rest. What fraction was saved?

Exercise 03 Revision Exercise on Fractions

1. What is the reciprocal of (a) 2? (c) y? (e) 0.5?
   (b) $\frac{3}{5}$? (d) 1 ½?
2. Use the reciprocal method and work out:
   (a) $\frac{3}{4} \div \frac{1}{4}$ (b) $1\ ^1/_3 \div 2\ ^1/_3$
3. Use the LCM method and simplify:
   (a) 2 ½ ÷ 1 ¼ (b) $\frac{3}{5} \div \frac{1}{10}$
4. How many quarter litre bottles can be got from 5 litres?

5. A sixth of my salary is 50,000/=. How much is my salary?
6. I spent 20,000/= out of my salary amounting to 40,000/=. What fraction of my salary did I spend?
7. Add: (a) 1.5 + 0.6 (b) 8.03 + 2 .1 (c) 0.05 + 22.5
8. Subtract: (a) 12.5 – 1.2 (b) 0.86 – 0.07 (c) 4 - 0.9
9. Add: 2.05 to 30.6
10. Subtract: 1.4 from 34
11. Work out (a) 7 – 4.27 + 3.14 (c) (3.021 – 2.2) + 0.04
    (b) 6 – (0.43 + 1.62 (d) 5.23 + 4 – 6.02
12. Maurice bought 6.4 litres of paraffin for some of his wall paint. He later bought 2.6 litres to mix all the remaining paint. How many litres of paraffin did he buy altogether?
13. Morgan was given 3.5 grammes of juice powder but 2.6 grammes got spoilt. How many grammes remained?
14. Multiply:(a) 0.9 by 0.2 (b)1.23 by 3.2 (c) 2 x 0.75
15. Divide: (a) 6 by 0.04 (b) 0.02 by 2

Exercise 04 Revision Exercise on Fractions

1. Divide: (a) 1.2 by 0.03 (b) 0.064 ÷ 0.06
2. Work out: (a) $\frac{0.8 \times 0.4}{0.2}$ (b) $\frac{0.04 \times 2}{0.8}$
3. The length of one side of a square is 4.5 metres.
   (a) What is the perimeter of the square?
   (b) What is its area
4. A rectangular garden measures 2.8 cm by 1.2 cm. Find its
   (a) perimeter (b) Area
5. A parcel weighting 8.5 kg contains packets of salt each weighting 0.25 kg. how many packets of salt are in the parcel?
6. There are 20 boys and 30 girls in a class. What is the ratio of
   (a) Boys to girls (b) girls to boys
7. Express the following rates as fractions
   (a) 1 : 6 (b) 2 : 4 (c) ½ ÷ ¼ (b) 0.2 : 0.4
8. Change the following fractions to ratios
   (a) $\frac{3}{4}$ (b) 1 ¼ (c) $\frac{8}{4}$
9. Peter and Sseku shared 32 sweets in the ratio 3 : 5. How many sweets did each get?
10. A man and his wife shared an amount of money in the ratio 2 : 3 respectively if his wife got 9,000/=
    (a) How much money did they share?
    (b) How much money did the man get?
11. 120 oranges were shared by Amos, John and Mary in the ratio 1 : 2 : 3 respectively. How many oranges did each get?
12. The ratio of sharing 24 goats by A, B and C is 2 : 3 : 7. If B got 6 goats how many goats did each of the rest get?

Exercise 05 Revision Exercise on Fractions

1. The ratio of boys to girls in a class is 2 : 5 If there are 14 boys, how many pupils are in the class?
2. Increase 320 in the ratio (a) 4 : 2 (b) 3 : 2
3. Decrease 480 in the ratio (a) 2 : 4 (b) 1 : 2
4. The price of an article was reduced from 18,000/= in the ratio 2 : 3. Find the new price.
5. The cost of an item was increased to 4000/= in the ratio 4 : 3. What was its original cost?
6. The price of a plastic basin was reduced to 12,000/= in the ratio 2: 3 Calculate its original price.
7. The number of pupils in Kasanke Primary School rose from 400 to 480 pupils. What is the ratio of increase?
8. In what ratio did the enrolment of school C fall from 60 pupils to 25 pupils in the previous year?
9. If one exercise book costs shs 300/=, what is the cost of 4 similar exercise books?
10. Three pencils cost 2400/=, what is the cost of 2 pencils of a similar kind?
11. Shs 3600/= can buy 2 pairs of socks.
12. 2 men can do a piece of work in 4 days. How many days will 6 men take to do the same piece of work at the same rate?
13. 5 women can did a garden in 15 days. How many woman can dig the same garden in 5 days at the same working rates?
14. A bus moving at a speed of 60 km/hr takes 2 hours to cover a certain distance. How long will the car take to cover the same journey at 120 km/hr?

Exercise 06 Revision Exercise on Fractions

1. Express (a) 4% as a fraction. (b) 12 ¼ % as a fraction
2. Change the following fractions to percentages.
   (a) $\frac{2}{5}$ (b) $\frac{3}{4}$ (c) $1\frac{1}{2}$
3. Change the following as decimal fractions
   (a) 0.5 (b) 1.25 (c) 0.075 (d) 0.014
4. Express the following as decimal fractions.
   (a) 0.2 % (b) 0.25% (c) 2.45%
5. Change the ratios below to percentages.
   (a) 1 : 4 (b) 3 : 8 (c) 2 : 3
6. Convert the following percentages to ratios
   (a) 25 % (b) 75% (c) 125%
7. If 25% of a choir are female, what percentage are the male?

8. There are 50 children in our poultry house. We sold 15 of them yesterday.
   (a) What percentage of chicken was sold?
   (b) Calculate the percentage of chicken that remained
9. What is 20% of 1800/=?
10. Find 15% of an hour.
11. Find 12 ½ of 800/=
12. A school enrolled 600 pupils of which 250 are boys.
   (a) How many are the girls?
   (b) What percentage are the (i) boys (ii) girls
13. (a) Express 500g as a percentage of 1 kg
   (b) Express 30 minutes as a percentage of 2 hours
   (c) Express 15 goats as a percentage of 90 goats
   (d) What percentage are 125 g of a kg?

Exercise 07 Revision Exercise on Fractions

1. 15% of a number is 60. find the number
2. 10% of my cattle are bulls. The bulls are 45. How many cattle are in my kraal?
3. Increase 400 by 20%
4. The number of children in a school last year was 360. This year the number increased by 25%. What is the number of the pupils in the school this year?
5. Decrease 280 by 14%.
6. An officer's salary is shs 80,000/=. How much will his salary be
   (a) If its decreased by 20% (b) If its increased by 25%
7. (a) Maizi bought a book at 450/= and sold it at 480/=. What was his profit?
   (b) Find his percentage profit.
8. Mugerwa bought a radio at shs 9450/- and sold it at 9000/=. What was his loss?
9. What is the percentage loss of buying an item at 800/= and selling it at 600/=.
10. The marked price of an article is 4000/=. If a trader allows a discount of 2% find: (a) The discount allowed
   (b) The actual price after the discount
11. Mukasa bought a book at 400/=, a pen at 500/= and a set mathematical instruments at 600/= and was offered a discount of 5%. How much did he pay altogether?

Exercise 08 Revision Exercise on Fractions

1. Calculate the simple interest on 20,000/= at a rate of 5 % per annum for 2 years.
2. Find the simple interest on 12,000/= at a rate of 4% per year for 2 ½ years.
3. Find the amount of money a trader will withdraw at a principle of 50,000/= at a rate of 2 % per annum for 5 years.
4. Calculate the time taken for 15,500/= to yield 15000/= at a rate of 5 % per year.
5. Find time taken on

Principal	Rate	S.I	Time
15,000/=	2%	6000/=	
120,000/=	10%	24,000/=	_____
400,000/=	5 %	1000/=	_____
700,000/=	20%	28,000/=	_____

6. Find the rate at which 40,000/= will yield 3,600/= after 2 years.
7. What principal will give an interest of 2,800/= at 10% interest for 2 years?

UNIT 6: GRAPHS
LESSON 1

Subtopic: Collection and Organization of data.

Content:
(i) Collection and recording information
(ii) Grouping information in a frequency table.
(iii) Organizing and recording information in a table.

Examples
(a) Collect and record the age of 20 pupils in P.6
i.e 10, 11, 12, 11, 12, 12, 11, 10, 12, 11
12, 11, 12, 13, 12, 13, 12, 11, 14, 11

(b) Make columns of (i) Different age groups
(ii) tallies with corresponding ages
(iii) frequency / no of occurrence of tallies / ages of individuals.

Age group	Tally	Frequency
10	||	2
11	𝍸 ||	7
12	𝍸 |||	8
13	||	2
14	|	1

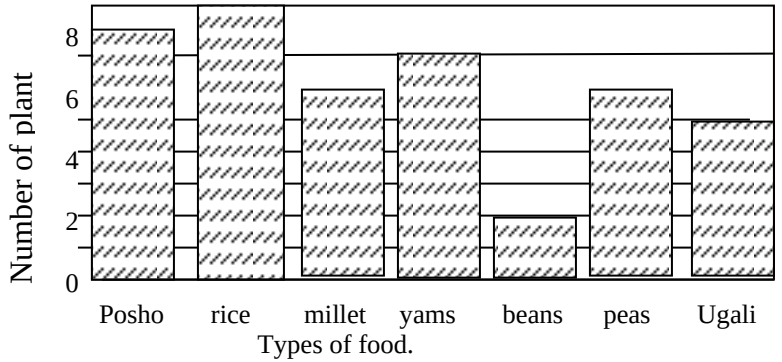
(c) Organise the information in a table form

Age in years	10	11	12	13	14
Number of pupils (Frequency)	2	7	8	2	1

Example: Given the table below its information can be found on a graph (bar graph)

Type of food	Posho	Rice	Millet	Yams	Beans	Peas	Ugali
No of pupils	8	9	6	7	2	6	5

The information in the table above can be put on the graph as shown below.



Questions

1. Which type of food is liked by most pupils?
   Rice is liked by most pupils
2. Which food is least liked?
   "Beans" is least liked
3. Which two types of food are liked by the same number of pupils?
   etc. millet and peas are liked by the same number of pupils.

Activity

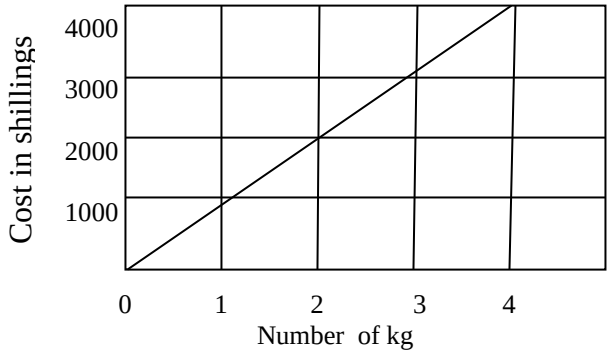
New Mk pg 85 – 86
Understanding mtc pg 132-133
Fountain pg 92

Remarks

_____

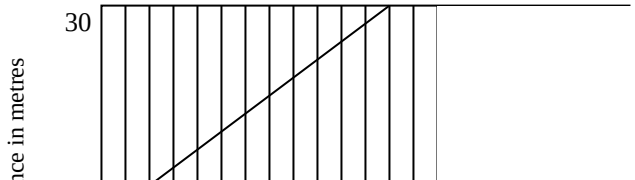
LESSON 2

Sub-topic: Line graphs
Content: Interpretation of a ready reckoner
Examples: (a) Study the graph and answer questions that follow



(a) What is the cost of 1kg of sugar?
100/=
(b) What is the cost of 4 kg of sugar?
4000/=
(c) How many kg of sugar can one buy with 2000/=?
2 kg
(d) What is the cost of 2 ½ kg of sugar?
2500/=

Content: Interpreting travel graphs (distance time graphs)
Example: The graph below shows Tom's journey.



Questions
(a) What is the scale on the vertical axis? (1 square represents 5 km)
(b) What is the scale on the horizontal axis? (1 square represents 15 minutes)
(c) How far was Tom at 9.30 a.m? (15 km)
(d) At what time was Tom 25 km away? (At 10: 30 am)

Activity
Fountain pg 102
|Mk old eition pg 167-168
Remarks

LESSON 3

Subtopic: Interpretation of information
Content: Finding the mode, median, mean and range
Examples: (a) Find the mode and the modal frequency of the following numbers.
8, 2, 6, 4, 5, 6, 9, 6, 2

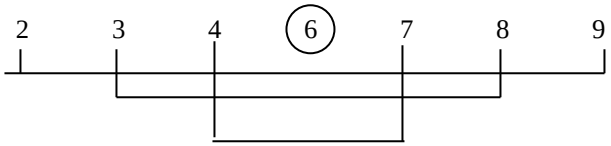
No	Tally	Frequency
2	//	2
4	/	1
5	/	1
6	///	3
8	/	1
9	/	1

The mode is 6

The modal frequency is 3.

Example (b) Find the median of the following numbers

4, 2, 6, 7, 3, 9, 8



Example: (c) Find the mean (average) of the following numbers.
2, 4, 5, 6, 3, 8, 7

Average = sum of all items / Number of items

$= \frac{2 + 4 + 5 + 6 + 3 + 8 + 7}{7} = \frac{35}{7}$

$= \mathbf{5}$

Activity
Trs' collection

Remarks

LESSON 4

Subtopic: Interpretation grouped data
Content: mode, median, range and mean
Example: The table below show the scores of marks got by pupils in a Mathematics test

Marks	60	80	90	45
No of pupils	2	1	3	4

Find the (i) mode (ii) median (iii) range (iv) mean

(i) From the table the mode is 45.

(ii) 45, 45, 45, 45, 60, 60, 80, 90, 90, 90

Median $= \frac{60 + 60}{2} = \frac{120}{2} = 60$

(iii) Range = H – L
= 90 – 45
45

(iv) Mean $= \frac{(60 \times 2) + 80 + (90 \times 3) + (45 \times 4)}{10}$

$= \frac{120 + 80 + 270 + 180}{10}$

$= \frac{650}{10} = 65$

Activity
Trs' collection

Remarks

LESSON 5

Subtopic: Interpretation of information

Content: Inverse problems on average

Example (a) The mean of 2, 4, 5, 6, and q is 5.
Find q

$\frac{q + 2 + 4 + 5 + 6}{5} = 5$

$5 \times \frac{q + 17}{5} = 5 \times 5$

$q + 17 = 25$

$q + 17 - 17 = 25 - 17$

$\mathbf{q = 8}$

Activity
Trs' collection
Pupils work out the following exercise

1. The mean of the following numbers are given, find the unknown.
   (a) 8, 4, 7, 2, 6, x, x +1. the mean is 10
   (b) 7, 9, a + 3, 68, 5, 3, the mean is 6.
2. The average of 3, 0, 7 and x is 4. What is the value of x?
3. The average of 7, x, 9, 8 and 10 is 8. Find the value of x.

4. If the average of x, 3x, 7x, 4x, and 0 is 6. find x.

LESSON 6

Subtopic: Interpreting information

Content: Inverse problems on average (cont)

Example: (a) The average of 3 numbers is 12. What is the sum of the 3 numbers?

$$\text{Average} = \frac{\text{sum of all items}}{\text{Number of items}}$$

$$12 = \frac{\text{sum}}{3}$$

$$12 \times 3 = \frac{\text{sum} \times 3}{3}$$

Sum = 36

Example (b) The average mark of 4 pupils is 6, and the average mark of 4 other pupils is 8. what is the average mark of all the 8 pupils.

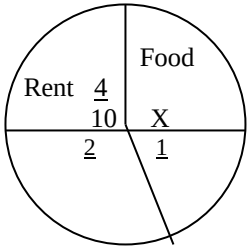
The total mark of 4 pupils = 4 x 6 = 24
The total mark of 4 other pupils = 4 x 8 = 32
The total mark of 8 pupils = 24 + 32 = 56
The average mark of 8 pupils = $\frac{56}{8}$ = 7

Activity
MK old edition pg 172-173

Remarks

LESSON 7

Subtopic: Pie chart
Content: Interpreting pie chart involving fractions
Example The pie chart shows how a man spends sh 300,000



10 10
Saving others

(i) What fraction of his money did he spend on food?
(ii) How much does he spend on rent?
(iii) How much more does he spend on food than others

(i) Let the fraction be x

$X + \frac{4}{10} + \frac{2}{10} + \frac{1}{10} = 1$

$X + \frac{7}{10} = 1$

$X + \frac{7}{10} - \frac{7}{10} = 1 - \frac{7}{10}$

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

$X = \frac{3}{10}$

The fraction is $\frac{3}{10}$

(ii) Expand on rent

$\frac{4}{10} \times 300{,}000$

= 120,000/=

(iii) $\frac{3}{10} - \frac{1}{10} = \frac{2}{10}$

$\frac{2}{10} \times 300{,}000$

= 60,000/=

(iii) OR Food

$\frac{3}{10} \times 300{,}000$

= 90,000/=

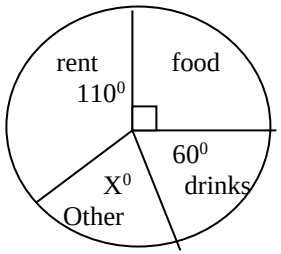
others

$\frac{1}{10} \times 30{,}000$

= 30,000/=

90,000 – 30,000
= 60,000/=

Example (b) The pie chart shows how a man spends sh 360,000



(i) Find the value of x

(ii) How much does he spend on Food?

(iii) How much more does he spend on rent than on food?

(i) $x + 60^0 + 110^0 + 90^0 = 360^0$

$X + 260 = 360$

$X + 260 - 260 = 360 - 260$

$X = 100^0$

Either:

(iii) $1100 = 600 = 500$

$\frac{50}{360} \times \frac{360{,}000}{1} = 50{,}000$

(ii) $\frac{90}{360} \times \frac{360000}{1} = 90{,}000/=$

OR (iii) $110 \times \frac{360{,}000}{360} = 110000$

$\frac{60}{360} \times \frac{36000}{1} = 60{,}000$

110,000 – 60,000 = 50,000

Activity

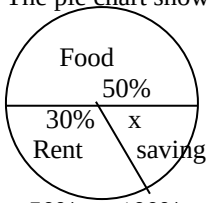
New MK pg 94-97
Fountain pg 93-97
Remarks

LESSON 8

Subtopic: Pie charts

Content: Interpreting pie chart involving percentages

Example: The pie chart shows how a man spends 180,000/=



(i) Find the value of x

(ii) How much does he spend of rent?

(iii) How much more does he Spend on food than on rent?

(i) x + 30% + 50% = 100%
X + 80% = 100%
X + 80% = 100%
X + 80% - 80% = 100% - 80%
X = 20%

Either

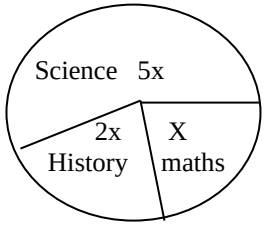
(iii) 50% - 20% = 30%
30% of 180000
= $\frac{30}{100}$ x 180000 = 54,000

(ii) 30% of 180000?=
$\frac{30}{100}$ x 180000 = 54,000

OR 50% of 180000 = 20% of 180000
= $\frac{50}{100}$ x 180000 - $\frac{20}{100}$ x 180000

= 90,000 – 36,000 = 54,000/=

Example: (b) The pie-chart represents the number of pupils taking Maths, history and Science. If there are 320 pupils in the school.



(i) Find the value of x

(ii) How many pupils do History

(iii) How many pupils do Science than history?

(i) x + 2x + 5x = 320
8 x = 320
8x = 320 40
8 8
X = 40

(ii) No who take History
= 2x
= 2 x 40
= 80 pupils

(iii) 5x – 2x = 3x
3x = 3 x 40
= 120^0

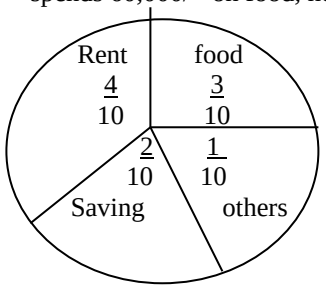
OR 5x – 2x
(5 x 40) – (2 x 40)
200 - 80
120 pupils.

LESSON 9

Subtopic: Pie chart

Content : Interpreting pie chart involving fractions

Example The pie chart below shows how a man spends his salary. If he spends 60,000/= on food, how much does he earn?



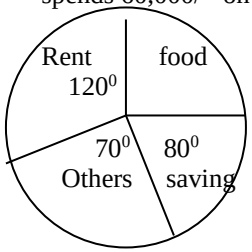
3 pts rep 60,000
1 pt reps $\frac{60,000}{3}$
10 pts rep 20,000 x 10
= **200,000/=**

Let his salary be y/=
$\frac{3}{10}$ of y = 60,000/=
10 x $\frac{10}{10}$ x 3y = 60,000 x 10
$\frac{3y}{3} = \frac{60,000 \times 10}{3}$

Y = 200,000/=

.

Examples: (c) The pie chart below shows how a man spends his salary. If he spends 60,000/= on food,



(i) let his salary be x/=
$\frac{90}{100}$ of x = 60,000/=

OR

(i) 90^0 represent 60,000/=
1^0 represents $\frac{60,000}{90}$

360 90
90 1 x = 60,000 360^0 represent 60,000 x 360 4
360 4 90 1

4 x X = 60,000/= x 4 = 240,000/=
4
= X = 240,000/=

(ii) 90 x 100% OR 60,000 x 100%
360 240,000
4 4
25 25
1 x 100 1 x 100% = 25%
4 1 4 1

Ref: trs' collection

LESSON 10

Subtopic: Pie chart.

Content: Constructing pie chart

Example: In a village 25% of the farmers grow bananas, 20% grow maize 15%, grow beans 10% grow cotton and 30% grow coffee. Use the above information and draw a pie chart.

5 18
Sector for bananas = 25 x 360 = 5 x 18 = 90^0
100
2 1

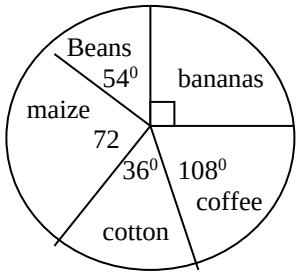
3 18
Sector for beans = 15 x 360 = 3 x 18 = 54^0
100
2 1

1
Sector for maize = 20 x 360 = 2 x 36 = 72^0
100

Sector for cotton = 10 x 360 = 1 x 36 = 36^0
100

Sector for coffee = 30 x 360 = 3 x 36 = 108^0

100



Activity
New MK pg 99-
Old MK pg 184-188
Fountain pg 98-99
Remarks

LESSON11

Subtopic: Pie charts

Content: Constructing pie charts.

Example: In a pupil's school bag there are 4 English books, 3 SST books, 5 Maths books and 6 Science books. Use the information and draw an accurate pie chart.

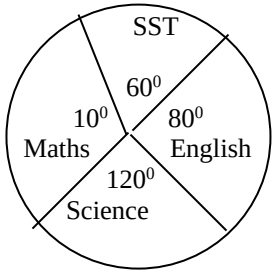
Solution The total number of books = 6 + 5 + 3 + 4 = 18 books

20
Sector for English books = 4 x 360 = 4 x 20 = 80^0
18 1

20
Sector for SST books = 3 x 360 = 3 x 20 = 60^0
18 1

20
Sector for English books = 5 x 360 = 5 x 20 = 100^0

Sector for English books = $\frac{4}{18_1} \times \frac{20}{360_1} = 6 \times 20 = 120^0$



Activity:

1. New MK pg 99
2. Old MK pg 184-188
3. A woman spends her income as follows 1000/= on transport, 2000/= on drinks, 3500/= on food and 2500/= on other things. Draw a pie chart to show the information.

Remarks

LESSON 12

Subtopic: Co-ordinate graphs

Content
(i) Naming axes
(ii) Reading plotted co-ordinate points from the graph
(iii) Plotting points on the graph.

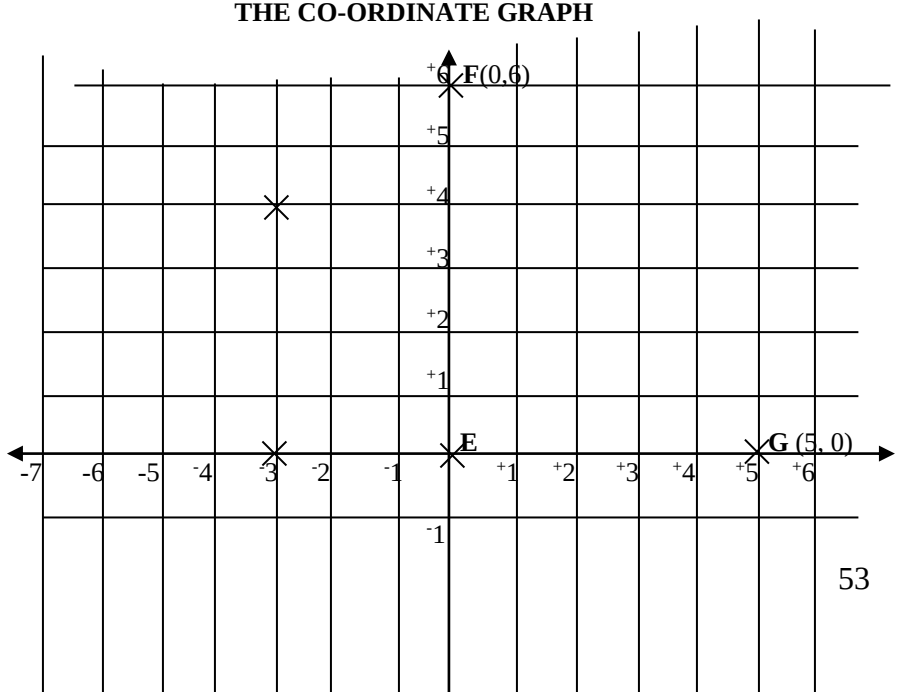
Example
(a) Horizontal Axis is the X – axis
(b) Vertical axis is the Y – axis.
(c)

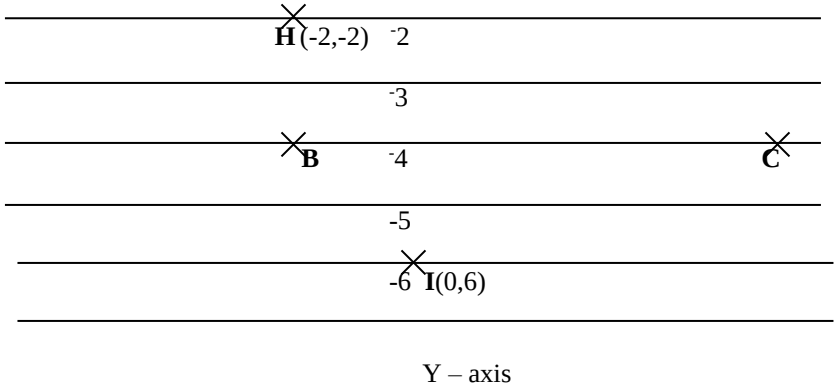
Points	co-ordinate (x, y)
A	(-6, $^+5$)
B	(-2, -4)
C	($^+6$, -4)
D	($^+3$, $^+5$)
E	(0,0)

(d) Plot the points F (0, 6) G (5, 0) H (-2, -2) and I (0, -6) on the coordinate graph given.

N.B 1st digit is found along the x – axis } to form the coordinates of a 2nd digit is found along the y – axis a point.

THE CO-ORDINATE GRAPH





Activity
1. Trs' collection

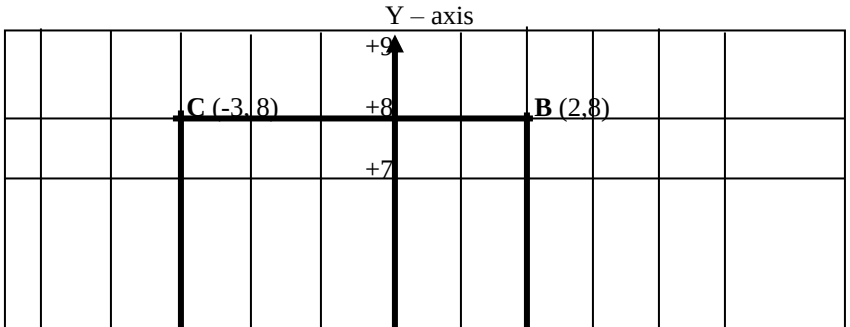
Remarks

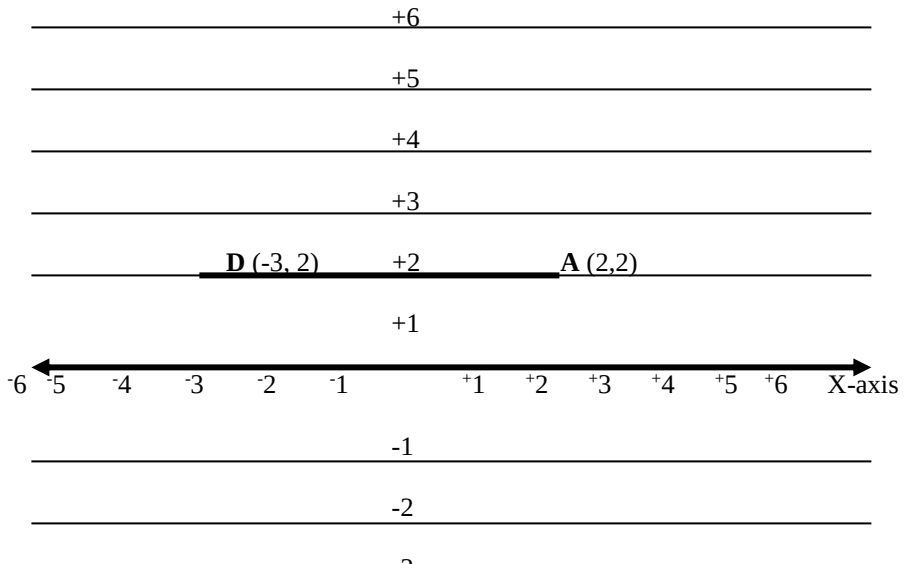
LESSON 13

Subtopic: Area and perimeter of shapes on the grid.

Content:
(i) Finding area of shapes on the grid.
(ii) Finding perimeter of shapes on the grid.

Example:
(a) Plot the following points on the co-ordinate graph below:
A (2, 2) B (2, 8) C (-3, 8) D (-3, 2)
(b) Join the points (done)
(c) Name the shape formed. (Rectangle)
(d) Calculate / find its area.
(e) What is its perimeter?





Area of figure = length x width
= AB x CD
= 6 units x 5 units
= 30 sq units

Perimeter = 2 (L + W)
= 2 (6 + 5) units
= 2 x 11
= **22 units**

Activity
Trs' collection

Remarks

Revision questions on graphs and interpretation of information

Exercise one

1. What is the mode of 4, 5, 2, 3, 9, 4 and 4
2. Find the median of 13, 11, 12, 8, 0 and 9.
3. Find the mean of 8, 6, 10 and 5.
4. The table below shows the results of a mathematics examination done by some pupils. study it and answer the questions that follow:

Mark	70	55	10	45	90

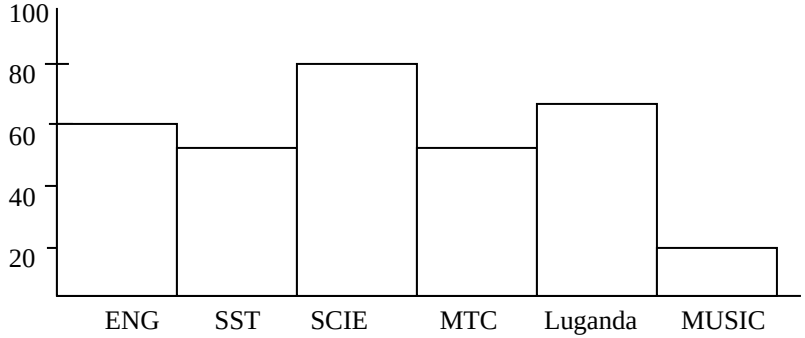
No of pupils	3		4	2	1

(a) How many pupils did the test
(b) Find the modal mark
(c) Find the modal frequency
(d) What is the average mark

5. The average of 3 numbers is 20. find the sum of the numbers.
6. The mean age of 6 boys is 10 years and that of 4 boys is 15 years. Find the mean age of the ten boys.
7. The mean of 3y, 2y, 5 and 2 is 5. find the value of y.
8. The mean of p, (p +1), (p + 2), (p + 3), 5 and 7 is 5. Find the value of p.

Exercise Two

1. The graph below shows Roberts score in various subjects

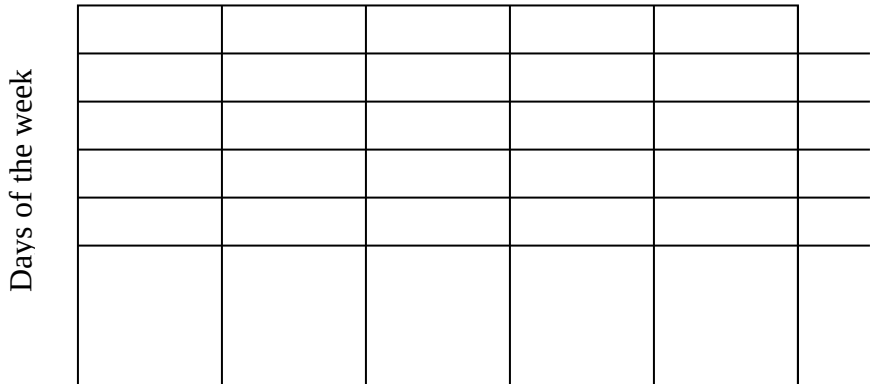


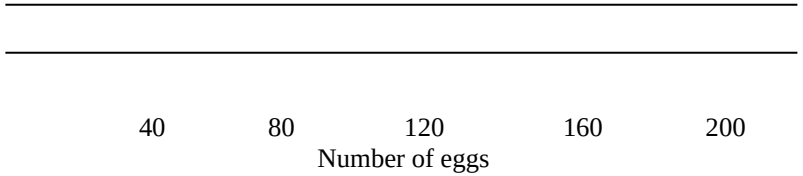
(a) How many marks did he score in Maths?
(b) In which subject did he perform best?
(c) Calculate Roberts average mark

2. Below is a table showing the number of eggs produced from Kasozi's farm in a week.

Day	Mon	Tue	Wed	Thur	Fri	Sat	Sun
No of eggs	20	15	175	140	185	160	190

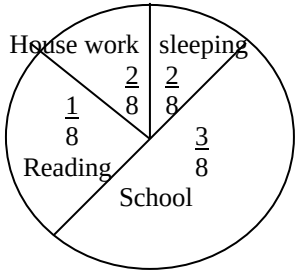
Represent the above information on the graph





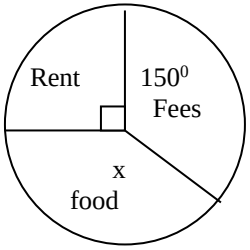
Exercise Three - PIE CHARTS

1. The pie chart below shows how Agudo spends her 24 hours in a day. Use it to answer questions which follow



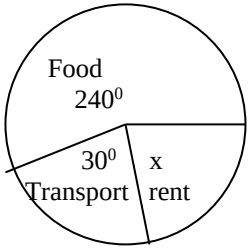
(a) How many hours does Agudo spend sleeping?
(b) How many more hours does she spend at school than doing house work?
(c) If she reads 2 books in one hour, how many books does she read in a day?

2. The pie chart below shows how Nakubuya spends his monthly salary of 126,000



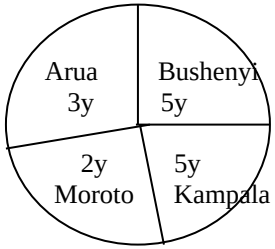
(a) Find the value of X.
(b) How much does he spend on rent?
(c) What percentage of his income is used for food?

3. The pie chart below shows Awori's monthly expenditure use it to answer questions that follow



(a) Find the value of X.
(b) If h spends 90,000/= on rent, find this total expenditure?
(c) How much more does he spend on food than transport?

4. The pie chart below shows the number of candidates who passed PLE in four districts. Use it to answer questions.



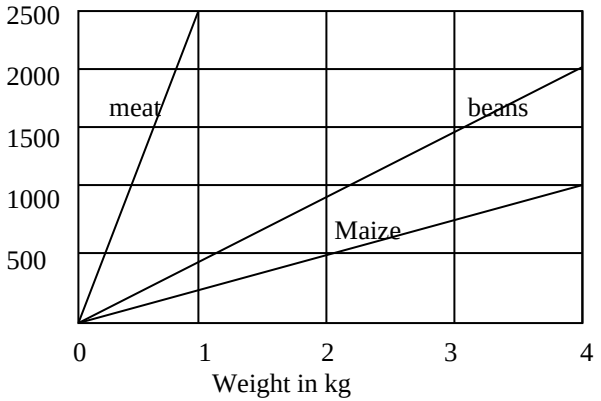
(a) If 600 candidates passed in Moroto. How many candidates sat for the examination?
(b) How many more candidates sat in Bushenyi than Arua

5. A man shored his salary as follows:
Musobya 36,000/=, Akugizibwe y /=, Opari 40,000/=, Laker 10,000/=. If the man had 108,000/= draw an accurate pie chart to show the above information.

6. At kigulu Primary School, 45% of the books in the library are for English, 15% Science, 20% Mathematics, 10% SST and X% are other subjects. In a circle of radius 3 cm, draw an accurate pie chart to show the above information

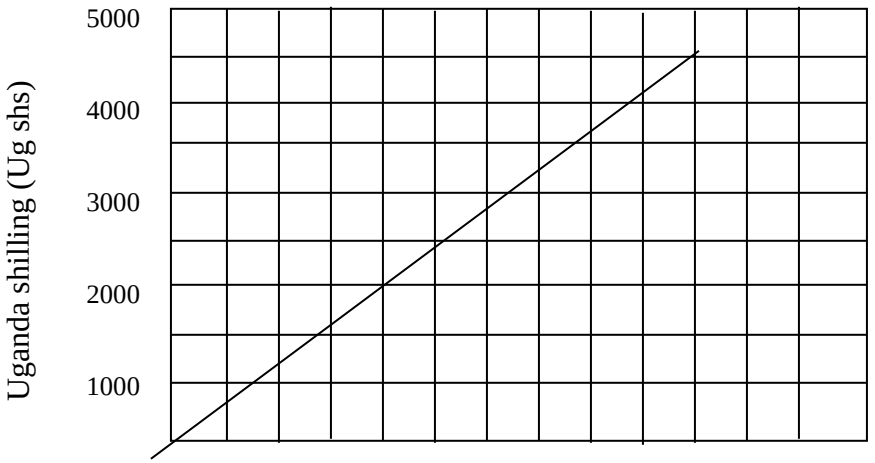
EXERCISE FOUR – LINE GRAPH

1. Study the line graph below and answer questions that follow



(a) What is the cost of maize per kg?
(b) What is the cost of meat per kg?
(c) What is the cost of beans per kg.
(d) How much will I pay if I buy 2 kg of meat, 3 kg of beans and 4 kg of maize.

2. The graph below shows the exchange rate of Uganda shilling against one US dollar, use it to answer questions that follow.



n sh

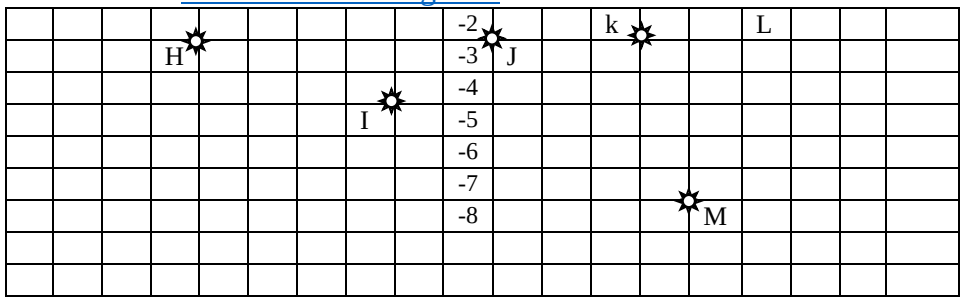
Email: tekule@tekartlearning.com

Website: www.tekartlearning.com

1 2 3 4 5

US Dolalr (US $)

(a) How many Uganda shillings are equivalent to US $ 4.5 ?
(b) Convert 2500 Uganda shillings to dollars.
(c) Kasim bought a shirt at 3.5 dollar. Find the price in Uganda shillings.
(d) How many Uganda shillings are equivalent to 1 US $?

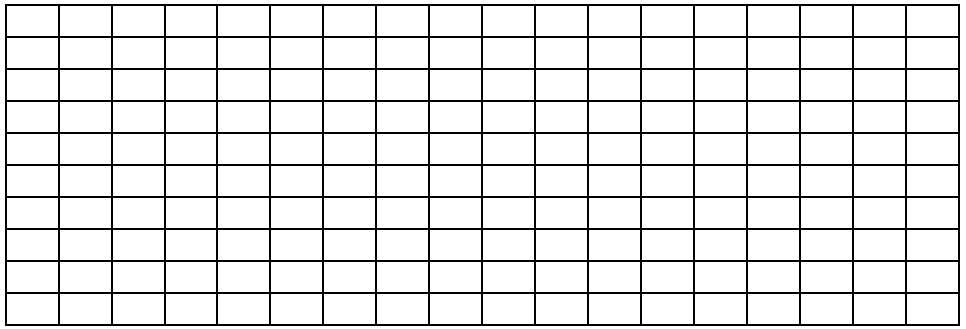


Write the coordinates of the points plotted in the graph.

A ( ) B ( ) C ( ) D ( ) E ( )
F ( ) G ( ) H ( ) I ( ) J ( )
K ( ) L ( ) M ( )

Plot the following points on the graph

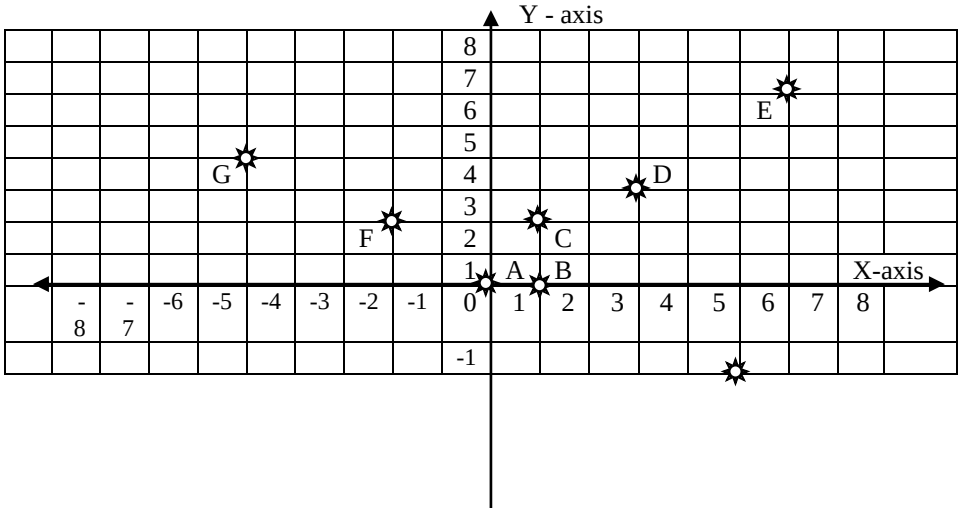
A (5, 2) b (-2, 2) C (-4, -1) D (3, -1)



(b) Join A to B, B to C, C to D, D to A
(c) What name is given to the polygon formed?
(d) Calculate the area of polygon formed in square units.

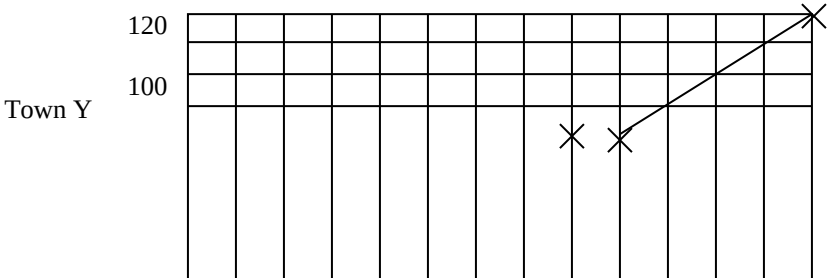
EXERCISE FIVE - COORDINATE GRAPH

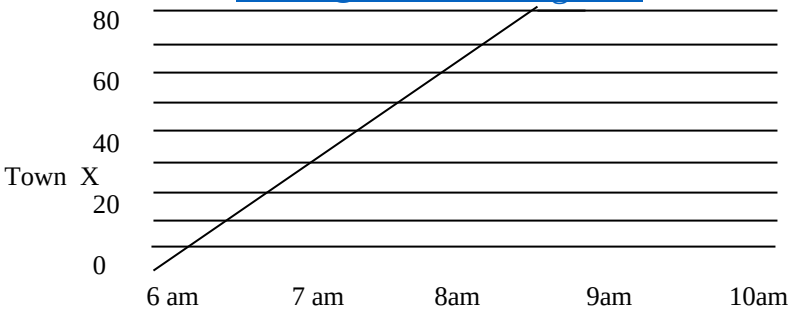
Below is a coordinate graph



EXERCISE SIX (TRAVEL GRAPHS)

The graph shows Emojongs journey from Pakwach to Kumi. Use it to answer questions that follow.





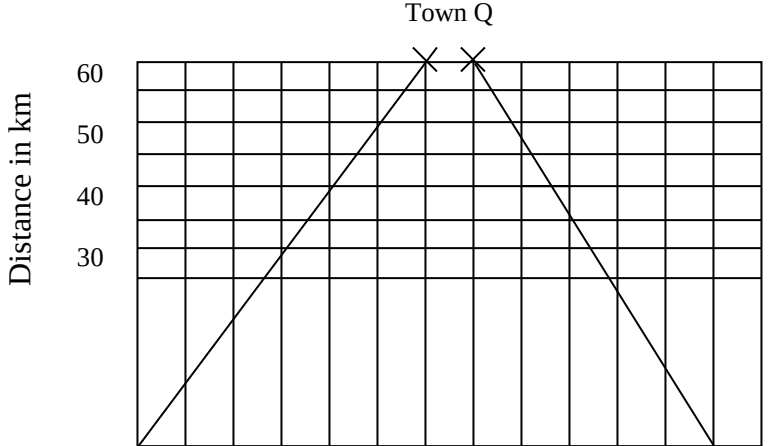
(a) At what time did Emojong arrive at town X?
(b) For how long did he rest at town Y?
(c) What distance had he covered by 6.20am?
(d) Calculate his average speed for the whole journey.

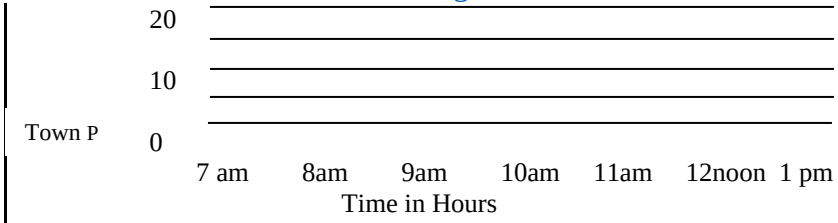
2. A gate way bus leaves Soroti at 8ooam and travels at 60km/hr for 2 hours. The driver rests for half an hour. He then continues for another 1 ½ hours at 40 km/hr until he reached his final destination.

(a) Draw a travel graph for the above information
(b) What was his average speed for the whole journey?

EXERCISE SEVEN – (TRAVEL GRAPHS)

1. Study the graph below and answer the questions which follow





(a) How far is town Q from town P?
(b) How long did the motorist take to travel from town P to Q?
(c) What was the average speed of the motorist 35km from P to Q?
(d) At what time was the motorist 35km from P?
(e) Calculate his average speed for the whole journey.

Examples Bank notes are numbered from A 003782 to A 003881.
P P

How many notes are there?
First note A 003782
P
Last Note A 003881
P
№ of notes = A 003881
P
- A 003782
P
99 without last note
Total № of Notes = 99 + 1
= 100 notes.

If denominations was worth shs 1000 per note then amount
= 1 note = 1000
100 notes = 1000 x 100 /=
= 100,000/=

Activity
Pupils will do exercise 10 : 3 page 218 in MK BK 6.

Remarks:

UNIT 8 MEASURES

UNIT / TOPIC: MEASURES

LESSON 1

Subtopic: MONEY

Content: Currencies.
Finding the number of notes/ denominations amount and its application in real life situation

LESSON 2

Subtopic: MONEY

Content: Uganda and other currencies

Example: Country currency
Uganda - Uganda shillings (U sh)
Kenya - Kenya shillings (K shs)
Rwanda - Rwanda Franc (RF)

South Africa - Rand (ZAB)
Zambia - Kwacha (Kch)
USA - US dollars ($)
Britain - Pound sterling (£)
Japan - Japanese Yen (¥)
European Union - Euro (euro)
German - Deutsch Mark (DM)

Rate

Currencies	Buying	Selling
1 pound sterling (£)	Ug shs 2500	Ug shs 2550
1 US dollar (US $)	Ug shs 1700	Ug shs 1720
I Kenya shillings K shs	Ug shs 19	Ug shs 20
1 Rwanda Franc (R.F)	Ug shs 1.9	Ug shs 2.2
1 Euro (Euro)	Ug shs 1520	Ug shs 1560
1 Tanzania shillings (TZ shs)	Ug shs 1.6	Ug shs 2

Example: A tourist arrived in Uganda with £ 7650. The exchange rate is £ 1 = Ug shs 2500, How much money in Uganda shillings did he have.

Solution

Bureau will buy from him.
£ 1 = Ug shs 2500
£ 7650 = Ug shs 2500 x 7650
Ug shs 19,125,000

Tamu has Euros equivalent to Ug shs 12480,000. Find the amount in Euros Tamu will get.

Solution

Bureau is selling Euros to Tamu
1 Euro = Ug shs 1560
Ug shs 1560 = 1 Euro

Ug shs 1 = $\frac{1}{1560}$ Euro

Ug shs 12480000 = $\frac{1}{1560}$ x 12480000, Euro

= 8000

~~12480000~~ Euros
~~1560~~

= 8000 Euros

Activity

Fountain pg 117
Understanding pg 180-181.

Remarks:

LESSON 1

Subtopic: TIME

Content:
- 24 hour clock
- conversion 12 hour clock to 24 hour clock

Examples: Time table

12 hr	24 hr clock
12.00 mid night	0000 hrs / 24 hours
11.00 pm	2300hrs
10.00pm	2200 hrs
9.00 pm	2100 hrs
8.00 am	2000 hrs
7.00 pm	1900 hrs
6.00 p.m	1800 hrs
5.00 p.m	1700 hrs
4.00 pm	1600 hrs
3.00pm	1500hrs
2.00 pm	1400 hrs
1.00pm	1300 hrs
12.00 Noon	1200 hrs
11.00 am	1100 hrs
10.00 a.m	1000 hrs
9.00 am	0900hrs
8 .00 am	0800 hrs
7. 00 am	0700 hrs
6. 00 am	0600 hrs
5. 00 am	0500 hrs
4. 00 am	0400 hrs
3 .00 am	0300 hrs
2. 00 am	0200 hrs
1. 00 am	0100 hrs

Example

1. write 12.45 pm in 24 hrs clock
   pm → + 1200 hrs
   1245 pm = 1245 hrs

2. Express 11 : 45 pm to 24 hrs clock
   pm 1200 hrs
   12 00
   + 11 45
   23. 45 hours

Activity

Pupils will do exercise 9 a and 9b page 217 and 218 respectively MK BK 5.

Remarks:

Content: Conversion of 24 hour clock to 12 hour clock

Example: 1. Express 04 00 hours as 12 hour clock

```
  04 00
- 00 00
  4. 00 am
```

2. Express 1330 hours as am or pm

```
  13 30 hrs
- 12 00
  1. 30 pm
```

Activity
Pupils will do exercise 9c page 218 MK BK 5.
Pupils will do exercise 24:4 page 23, MK BK 6 (old)
Tr's collection
Remarks:

LESSON 2

Subtopic: TIME

Content: Finding duration

Examples. (i) How many hours are there between 11 00 hours and 1830 hours

```
  18 30 hrs
- 11 00 hours
   7. 30      =   7 hours 30 minutes
```

(ii) An exam started at 1359 hours and ended at 1610 hours. How long was the exam?

```
  16 10 hours
- 13 59 hours
   2. 11      =   2 hours 11 minutes
```

Activity
Pupils will do exercises 24 : 6 in MK BK 6 (Old) pg 224-225

Remarks:

LESSON 3

Subtopic: Distance, Speed , Time

Content: Distance

1. Find the distance travelled by a car in 3 hours at 60 km/hr
   Speed = 60 km/hr
   Time = 3 hours
   Distance = speed x time
   = 60 km/hr x 3 hours
   = 60 x 3 $\frac{km}{\cancel{hr}\ 1}$ x $\frac{\cancel{hr}}{1}$
   = 180 km.

2. A car takes 2 ½ hrs to cover a journey at a speed of 40 km/hr. Find the distance travelled.
   Speed = 40 km/hr
   Time = 2 ½ hrs
   Distance = speed x time
   = 40 km / hr x 2 ½ hr
   $40 \times 2\frac{1}{2} \frac{km}{\cancel{hr}\ 1} \times \frac{\cancel{hr}}{1}$
   $\frac{20}{\cancel{40} \times \underline{5}\ km}{\cancel{2}\ 1}$
   Distance = 100 km

Activity
NB: Finding distance with minutes and km/hr on duration
Old Mk 228-230
New Mk pg 112
Understanding Mtc 121-123

Remarks:

LESSON 4

Subtopic: Distance , speed, Time

Content: Speed

$$\text{Speed} = \frac{\text{distance}}{\text{Time}}$$

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

Time = 3 hours

Distance = 210 km

$$\text{Speed} = \frac{\text{distance travelled}}{\text{Time taken}}$$

$$= \frac{\overset{70}{\cancel{210}}\ \text{km}}{\cancel{3}\ \text{hrs}}$$

Speed = 70 km/hr

Activity

Pupils will do exercise 10 : 16 page 235 MK BK 6

New MK 114

Old edition 231-233.

Remarks:

LESSON 5

Subtopic: Distance, Time Speed

Content: Expressing km/hr as m/sec

Example: Express 72 km/hr as m/sec

Means distance = 72 km Time = 1 hr

Distance time

I km = 1000m hr = 3600 sec

70 km = 72 x 1000 m

= 72000m

$$\text{Speed} = \frac{\text{distance}}{\text{Time}}$$

$$= \frac{\overset{20}{\cancel{72000}}\text{m}}{\cancel{3600}\ \text{sec}}$$

$$= \frac{20\text{m}}{1\text{sec}}$$

Activity

Pupils will do exercise 10 : 17 page 236 MK BK 6.

New MK 113

Remarks:

LESSON 6

Subtopic: Distance, Time, Speed

Content: Expressing m/sec as km/hr

Example: Express 100m/sec as km/hr

Meaning = 100 m in 1 sec

Distance time

1000m = 1 km 3600/sec = 1 hr

$\frac{1}{100}$ km 1 sec = $\frac{1}{3600}$ hr

1 m = $\frac{1}{100}$ x $\frac{1\cancel{00}}{1\cancel{0}}$ km

100m = $\frac{10\cancel{00}}{1}$ km

= $\frac{10}{1}$

= 0.1 km

$$\text{Speed} = \frac{\text{distance}}{\text{Time}}$$

= distance ÷ time

$$= \frac{1\text{ km}}{10} \div \frac{1\text{ hr}}{360}$$

$$= \frac{1}{1\cancel{0}} \times \frac{360\cancel{0}}{1}\ \text{km/hr}$$

= 360 km/hr

Activity

New Mk pg 116

Old Mk pg 236

Remarks:

LESSON 7

SUBTOPIC: Distance, Time, Speed

Content: Finding average speed.

Examples: A car takes 2 hours to cover a certain distance at 60 km/hr but it returns in 3 hrs. Calculate the average speed of the car for the whole journey.

To journey	Fro journey
Time = 2 hrs	time = 3 hrs
Speed = 60 km/hr	speed = 60 km/hr
Distance = speed x time	distance = speed x time
= 60 km/hr x 2 hrs	= 60km/hr x 3 hrs
60 x 2 km x ~~hr~~ 1	= 60 x 3 km x ~~hr~~ 1
~~hr~~ 1	~~hr~~ 1
Distance = 120 km	distance = 180 km

Average speed = $\frac{\text{total distance travelled}}{\text{Total time taken}}$

= $\frac{120 + 180 \text{ km}}{2 + 3 \text{ hrs}}$

= $\frac{60}{\frac{300}{5}\ 1 \text{ hr}}$ km

= 60 km/hr

Activity
New Mk 115
Old Mk 235

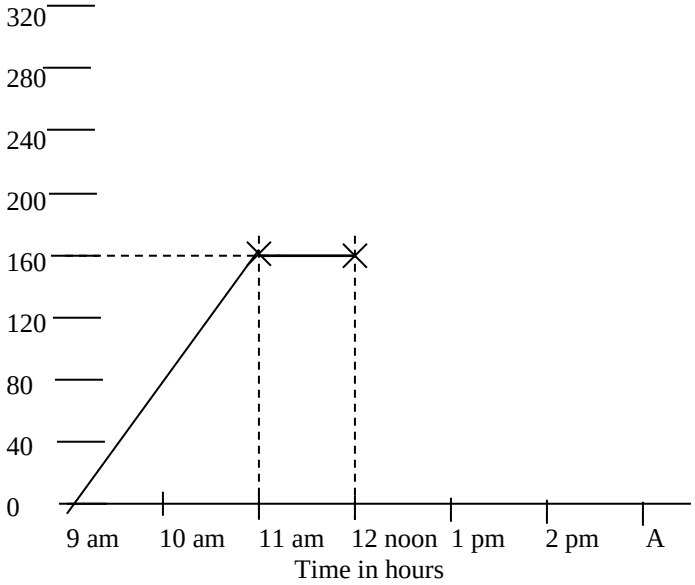
Remarks:

LESSON 9

Subtopic: Distance, speed, Time

Content: Travel Graph

Example: In reference to graph on page 239 MK BK 6.
Teacher will guide the pupils through the questions that follow the graph.



Sample question
(a) What is the distance between A and B? = 160 km.
(b) What happened at B?)resting)

Activity
Pupils will do exercise 10 : 24 page 240 MK BK 6.
New Mk 115-120
Understanding pg 192-193

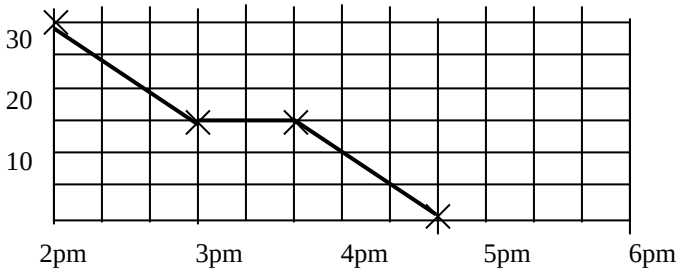
Remarks:

LESSON 10

Subtopic: Travel graphs

Content: Interpreting return journeys on travel graphs

Examples: Oseke left his mother's house 30km away, use the graph to answer questions that follow.



(a) What is the scale on the vertical axis? (1 square represents 5 km)
(b) What is the scale on the horizontal axis? (1 square represents 20 minutes)
(c) Calculate Oseke's average speed before he rested?
$\left(\frac{15\text{ km}}{1\text{ hr}} = 15\text{km/hr}\right)$
(d) How far from home was Oseke at 4 : 20 p.m? (5 km away)
(e) At what time did he arrive at his home? (At 4 : 40 p.m)

Activity
Pupils will do exercise 108 on page 176 No 5, 6, and 8 of Revision Maths for upper primary.

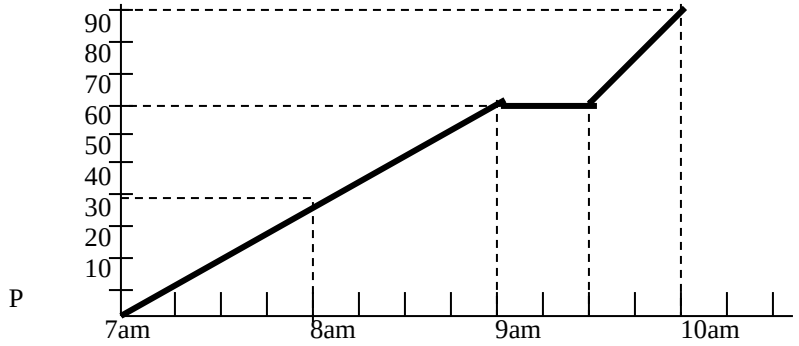
Remarks

LESSON 11

Subtopic: Travel graphs

Content: Drawing travel graphs

Examples: Nduga started from town P at 7 a.m and covered 60km in 2 hours, then he rested for 30 minutes. Then covered the remaining 30 km to town R in 30 minutes.
(a) Show Nduga's journey on a travel graph.
(b) At what time did he start his rest?
(c) Where was Nduga after the first hour?
(d) Calculate Nduga's average speed for the whole journey.



Answers
(b) At 7 am (c) 30 km away (d) A.V speed = $\frac{90\text{km}}{3\text{hr}}$ = **30km/ hr**

Activity
Pupils will do exercise 2 Nos 1 – 5 on page 109 of Oxford Primary MTC pupils BK 6.

Remarks

TOPIC LENGTH, MASS AND CAPACITY

LESSON 1
Subtopic: Length
Content: Measuring
Example: Learners will participate in measuring and recording length of different objects
i.e Book (length)
book (width)
book (thickness)
Geometry set (length, width, thickness)
pencil (length)
door (length, width)
window (length, width)
table (length, width, thickness)

Activity
Teacher will organize different objects to be measured by the pupils.
Old Mk 313-315

Remarks:

LESSON 2

Subtopic: Length

Content: Changing from small to large units
- metres to kilometres
- centimetres to metres

Examples: Change 2500 metres to kilometres

1000m = 1 km

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

2500m = $\frac{1}{1000}$ x 2500 km

= $\frac{25}{10}$ km

= 2.5 km

(ii) Change 300 cm to m

100 cm = 1 metre (m)

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

300 cm = $\frac{1}{100}$ x 300 m

= 3 m

Activity

Pupils will do exercise 13. 5 and 13.6 page 315 – 316 MK BK 6.
Old Mk 315-316

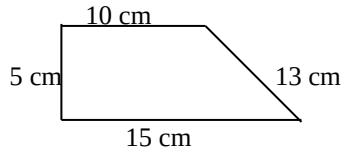
Remarks:

LESSON 3

Subtopic: Length

Content: Perimeter of geometrical figures

Example: 1. Find the perimeter of the figure below



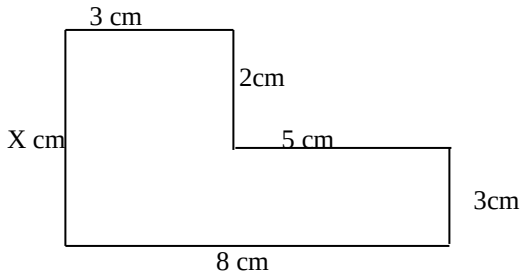
Perimeter is the total distance around the figure.

∴ Perimeter = $S_1 + S_2 + S_3 + S_4$

= 15 cm + 5 cm + 10 cm + 13 cm

= 43 cm

(2) Find the perimeter



Side X = 2 + 3

X = 5 cm

Perimeter = $S_1 + S_2 + S_3 + S_4 + S_5 + S_6$

= 8cm + 3cm + 2 cm + 5 cm + 3cm + 5 cm

= 26 cm

Activity

Pupils will do exercise 13 : 12 and 13.13 page 320- 321 MK BK 6.
Old Mk 320
New MK 125

Remarks:

Email: tekule@tekartlearning.com

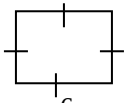
Website: www.tekartlearning.com

LESSON 5

Subtopic: Area

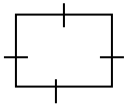
Content: Area of shapes

Example: Find the area of a square whose side is 6cm



Area = side x side
= 6cm x 6cm
= 36 cm^2

Find the area of a square whose side is pcm

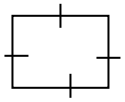


Area = side x side
= pcm x p cm
= P^2 cm^2

Content : Find one side of the square.

Example: The area of a square is 64cm^2. Find the length of each side of the square.

Let one side be p cm



S x S = Area
P x P = 64
P2 = 64
P = (2 x 2) x (2 x 2) x (2 x 2)
P = 2 x 2 x 2
P = 8
Each length = 8 cm

Factorise

(2	64
(2	32
(2	16
(2	8
(2	4
(2	2
	1

Activity

Pupils will do exercise 13 :18 page 328 MK BK 6.
Pupils will do exercise 13 :19 page 329 MK BK 6
New MK 122-123.

Remarks:

_____

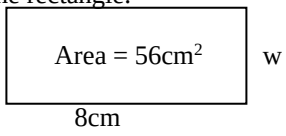
_____

LESSON 6

Subtopic: Area

Content: Finding the side of a rectangle when area is given

Example: The area of a rectangle is 56cm^2. The length is 8cm. find the width of the rectangle.



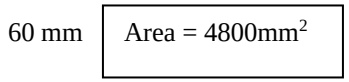
L x W = Area
8cm x w = 56cm^2

$\frac{8cm \times w}{8cm} = \frac{56\ cm^2}{8\ cm}$

$\frac{1}{} \qquad \frac{1}{}$

W = 7 cm
Width = 7 cm

11. A rectangular piece of paper is 4800mm^2. Its width is 60 mm. Find its length



Length x width = Area
L x W = Area
L x 60 mm = 4800mm^2

$\frac{L \times 600mm}{60mm_{\,1}} = \frac{4800mm^2}{60mm_{\,1}}$ (80)

L = 80 mm

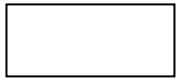
Content: Finding area when perimeter is given

Example: 2 The perimeter of the rectangle is 24 cm and the width is 5cm

Find the (a) length of the rectangle

(b) Area of the rectangle

(a) 2 (L + W) = perimeter
2 (L + 5cm) = 24 cm
2L + 10 cm = 24 cm
2L + 10 – 10 = 24cm – 10cm
2L = 14 cm
$\frac{2L}{2} = \frac{14}{2}$
$L = 7_1$ cm
L = 7 cm



Area

Area = L x W
Area = 7cm x 5 cm
Area = 35 cm ^{2}

Activity

Pupils will do exercise 13 :23 page 333 MK BK 6.
New MK pg123-125

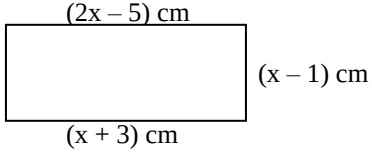
Remarks:

LESSON 7

Subtopic: Area

Content: Finding sides, Area and perimeter

Example: ABCD is a rectangle.



(i) Find the value of x
(ii) Find width and length
(iii) Find the area of the figure

(i) Find the unknown
2x – 5 = x + 5
2x – x = 3 + 5
X = 8

(ii) Length . x + 3
8 + 3 = 11 cm

Width: x – 1
8 – 1 = 7 cm

(iii) Area = L x W
= 11 cm x 7 cm
77 cm ^{2}

(iv) Perimeter = 2(L + W)
= 2 (11 cm + 7cm)
2 x 18cm
Perimeter = 36 cm

Activity

Pupils will do exercise 13 :24 page 334 - 335 MK BK 6.
Tr's collection

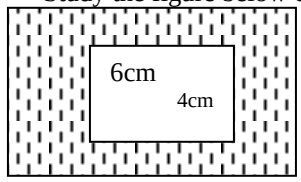
Remarks:

LESSON 8

Subtopic: Area

Content: Finding area of shaded part.

Examples: Study the figure below carefully.

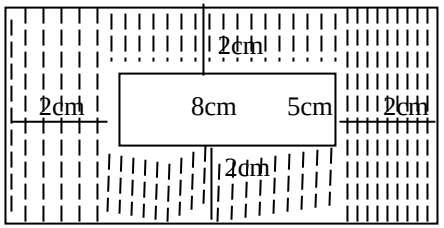


Find the area of the shaded part.

Area of outer rectangle = L x W
= 10cm x 9 cm
= 90cm^2.
Area of inner rectangle = L x W
= 6 cm x 4 cm
= 24cm^2

Area of shaded part = $90cm^2 - 24cm^2$
= $66cm^2$

2.



Find area of shaded part.
Length of outer rectangle = 8cm + 2 + 2cm
Width of outer rectangle = 12 cm
= 5 + 2 + 2 = 9cm
Area outer rectangle = L x W
= 12cm x 9 cm
= 108 cm^2

Area of shaded part = $108cm^2 - 40cm^2$
= $68cm^2$

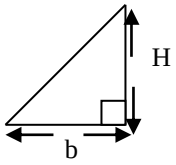
Activity
Pupils will do exercise 13 :25 Nos 1 - 6 page 337 in MK BK 6.
Understanding pg 262-263
Remarks:

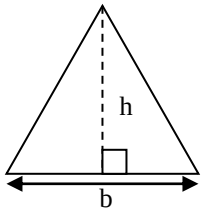
LESSON 9

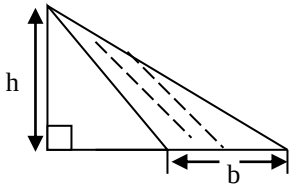
Subtopic: Area

Content: Finding area of a triangle

Examples:

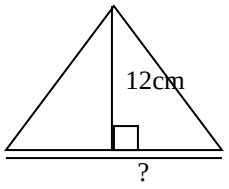






Area is ½ x b x h

Examples: 2 Find the base of a triangle whose area is $60cm^2$ and height is 12cm
Diagrammatic representation



Area $60cm^2$

BASE = $\frac{2 \times Area}{Height}$

½ x b x h = Area

$\frac{1}{2} \times b \times 10cm = 60\ cm^2$

$b \times 6cm = 60\ cm^2$

$6\ cm \quad 6\ cm$

$b = 10\ cm$

Activity
Pupils will do exercise 13 :27 page 339 to 340 MK BK 6.
New MK 127
Fountain 135-136

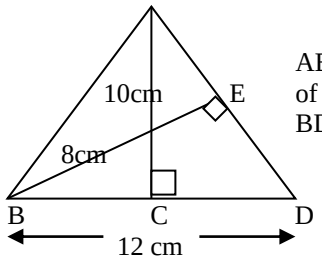
Remarks:

LESSON 10

Subtopic: Area

Content: Finding Base or Height by comparing area

Example:



ABC is a triangle AC and BE are heights of the same triangle.
BD = 12cm , AC = 10cm BE = 8cm
Find the length of AD

Area triangle ABD with height AC = ½ bh same triangle with
Area Triangle ABD with height BE = ½ bh different heights
has the same area.

½ bh = ½ bh

$\frac{1}{2_1}$ AD x $\frac{8cm}{4cm}$ = $\frac{1}{2_1}$ x $\frac{12cm}{6}$ x 10cm

AD x 4 cm = 60 cm

$\frac{AD \times \cancel{4}\ cm}{\cancel{4}\ cm_1} = \frac{\cancel{60}\ cm\ 2}{\cancel{4}\ cm_1}$

AD = 15 cm

Activity
Pupils will do exercise 13 :28 page 342 MK BK 6.

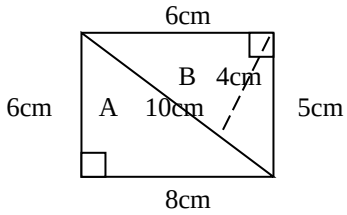
Remarks:

LESSON 11

Subtopic: Area

Content: Finding area of combined shapes

Examples: Find the area of the whole figure.



Name the identified figures in above.
A and B

Area A = ½ x b x h

$\frac{1}{2_1}$ x $\frac{8cm}{4cm}$ x 6cm

Area B = ½ x b x h

$\frac{1}{2_1}$ x $\frac{10}{5}$ x 4cm

$24cm^2$ = 5cm x 4 cm
= $20cm^2$

Area of whole figure = AA + AB
= $24cm^2 + 20cm^2$
= $44cm^2$

Activity
Pupils will do exercise 13 :29 page 343 MK BK 6.
Understanding mtc pg 258

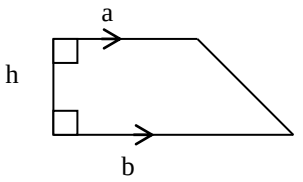
Remarks:

LESSON 12

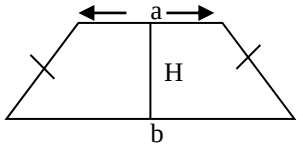
Subtopic: Area

Content: Area of a trapezium

Examples: Trapezium are of two types.



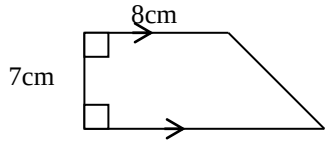
right angled trapezium



isosceles trapezium

Find the area of the trapezium below
Area = ½ h (a + b)

Find the area of the trapezium below



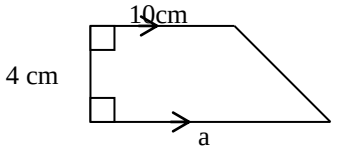
Area = ½ h (a + b)
= ½ x 7cm (8 + 10cm)

$= \frac{\cancel{1}}{\cancel{2}_{1}} \times 7 \times \frac{\cancel{18}^{9}}{1}\ cm^2$

$= 63cm^2$

Content: Finding one side of a trapezium

Examples: The area of a trapezium is $60cm^2$, the height is 4cm and one of the parallel sides is 10cm. find the length of the second parallel side.



$\frac{1}{2} h (a + b) = Area$

$\frac{1}{2} \times 4\ cm\ (a + 10) = 60cm^2$

$2cm\ (a + 10) = 60\ cm^2$

$2acm + 20cm = 60cm^2$

$2acm + 20 - 20 = 60 - 20$

$2a = 40$

$\frac{\cancel{2}a}{\cancel{2}_{1}} = \frac{\cancel{40}^{20}}{\cancel{2}_{1}}$

$a = 20\ cm$

Second parallel side is 20 cm

Activity

Pupils will do exercise 15 : 31 page 346 MK BK 6.

New MK pg 128

Remarks

LESSON 13

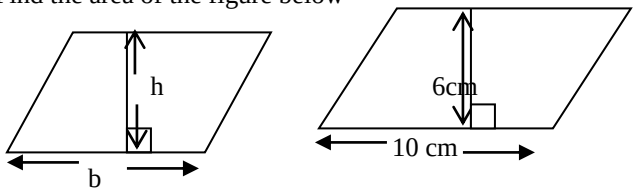
Subtopic: Area

Content: Area of parallograms

Examples

AREA OF PARALLOGRAM = BASE X HEIGHT

Find the area of the figure below



area = BASE x HEIGHT

= 10 cm x 6 cm

Area = 60cm2

Activity

Pupils will do exercise 15 : 32 page 347 MK BK 6.

New Mk 129

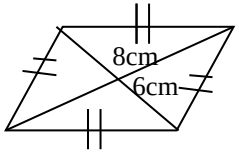
Remarks

LESSON 14

Content : Area of rhombus and kite

Example 1.

Find the area of the rhombus below



Area = $\frac{1}{2} d_1 \times d_2$

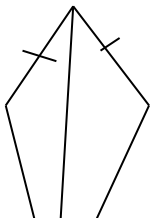
$\frac{1}{2} \times 8cm \times 6cm$

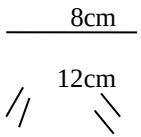
$4cm \times 6cm$

$24cm^2$

Example II

Find the area of the kite





Area = $\frac{1}{2} d_1 \times d_2$

$\frac{1}{2}$ x 8cm x 12cm

4cm x 12cm

$48cm^2$

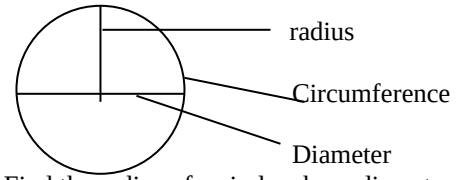
Ref: New Mk pg 130

LESSON 15

Subtopic: length

Content: Circumference - radius
Diameter

Examples: **Circumference**: is distance around a circular object.
Diameter*:* The longest distance through the centre of a circle object to the covered line.
Radius: Half the diameter distance



(i) Find the radius of a circle whose diameter is 40 cm.
Radius = $\frac{\text{diameter}}{2}$
= $\frac{\cancel{40}^{20}}{\cancel{2}_{1}}$
= radius = 20 cm

(ii) Find the diameter of circle whose radius is 3 ½ cm
Diameter = 2 x r
= 2 x 3 ½ cm
= $\cancel{2}^{1} \times \frac{7}{\cancel{2}_{1}}$
Diameter = 7 cm

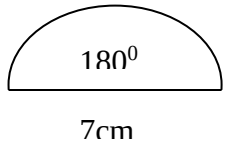
Content: Calculating circumference of a circle

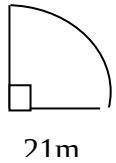
Examples: (i) Find the circumference of a circle whose diameter is 10 cm. (Use $\square$ = 3.14)
Diameter = 10 cm
Circumference = $\square$ D
= 3.14 x 10 cm
= $\frac{3.14}{\cancel{10}_{1}} \times \cancel{10}$ cm
= 31.4 cm

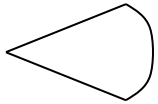
Ref: understanding mtc pg 254-257
New MK pg 132

LESSON 16

Content: perimeter of sectors of a circle
Example 1
Find he perimeter of these shapes





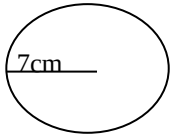


$\angle 36^0$
10cm

Ref: Mk new Mk pg 133

LESSON 17

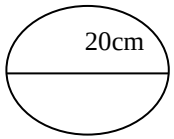
Content: finding the area of a circle
Example 1
Find the area of the circle



A = πr^2

= $\frac{22}{7}$ x 7 x 7
= 22 x 7
= 154cm^2

Example 2
Calculate the area of the circle below



A = πr^2

= 3.14 x 10 x 10
$\frac{314}{100}$ x 100

= 314cm^2

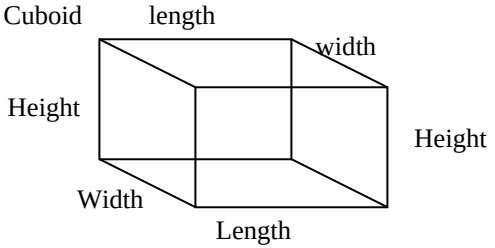
Ref: new MK 134

LESSON 18

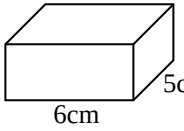
Subtopic: Area

Content: Finding total surface Area

Examples: Cuboid



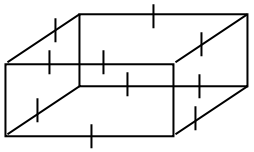
A rectangular box has 6 faces
2 faces of length and width
2 faces of width and height
2 faces and length and height
2 (length x width) +2 (width x height) + 2 (length x height)
2 (L x w) + 2 (w x h) + 2 (l x h)
TSA = 2 (LW) + 2 (Wh) + 2 (Lh)



TSA = 2 (lw) + 2(wh) + 2(hl)
= (2 x 6 x 5) + (2 x 5 x 4) + (2 x 6 x 4) cm^2
= 60 + 40 + 48 cm^2
TSA = 148 cm^2

Content: Total Surface Area of a Cube
Examples: Cube

- Cube has all edges equal
- Cube has all its faces equal
- Each face is a square



It has 6 equal faces
Area of one face = S x S
$= S^2$ where S is side
∴ 6 faces will have area $6 \times S^2$
∴ TSA of cube = $6S^2$

Find the total surface area of a cube whose side is 4cm
TSA = $6 \times S^2$
TSA = 6×4^2
TSA = $6 \times 4 \times 4\ cm^2$
TSA = $\underline{96cm^2}$

Activity
Pupils will do exercise 13:34 and 13:35 page 350 and 351 respectively in MK BK 6. .

Remarks
_____

LESSON 19

Subtopic: Area

Content: Finding sides of a cube
Examples: The total surface area of a cube is $384cm^2$. Find the length of each side of a square.
TSA = $384cm^2$.
But $6S^2$ = TSA

$\frac{^1 6S^2}{^1 6} = \frac{^{64} 384}{^1 6}$

$S^2 = 64$

$\sqrt{S^2} = \sqrt{64}$
$\underline{S = 8cm}$

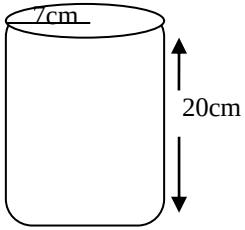
Activity
Pupils will do exercise 13:36 page 351 MK BK 6.

Remarks
_____

LESSON 22

Subtopic: volume

Content: volume of a cylinder
Examples
Find the volume of the cylinders below



A $= \pi r^2 h$

$= \underline{22} \times \cancel{7} \times 7 \times 20$
$\cancel{7}$
$= 22 \times 7 \times 20$
$= 154 \times 20$
$= 3080cm^2$

Ref: new Mk pg 137

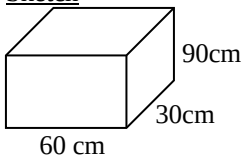
LESSON 20

Subtopic: Capacity

Content: Volume (3 dimensional figures.)

Example: A rectangular tank is 30cm by 60 cm by 90 cm. Find its volume in litres.

Sketch



Volume of the tank = L x w x h
= (30 x 60 x 90) cm^3
1 litre = $100cm^3$
No of litres in the tank
= $\frac{30 \times 60 \times 90}{1000}$
= 162 litres

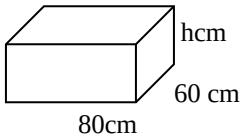
Activity
Pupils will do exercise 35.8, Nos 1 – 10 on page 373 of a New MK pupils BK 6. (Old ed)
New Mk 139-141
Remarks

LESSON 21

Subtopic: Capacity

Content: application of volume and capacity

Example: The rectangular tank below holds 72 litres of water. Calculate the volume of h.



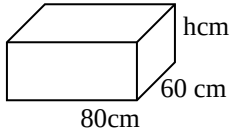
Solution: I litre = $1000cm^3$
The volume of water in the tank is (72 x 1000) cm^3.
Therefore 80 x 60 x h = 72 x 1000
h = $\frac{72 \times 1000}{80 \times 60}$

$\frac{1}{\cancel{72}_{\cancel{9}3}} \times \frac{\cancel{1000}^{5}}{\cancel{80} \times \cancel{60}}$

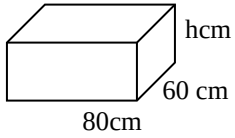
h = 15 cm

Activity

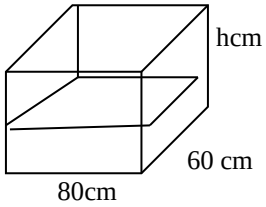
1. The tank below holds 72 litres of water.. find h.



2. The tank below holds 280 litres of water find h.



3. The tank below is $^1/_3$ full of water. How many litres of water are in the tank?



Ref: old Mk pg 359-360
Understanding pg 266-268
Remarks

LESSON 23

Subtopic: Capacity

Content: Conversion of cm^3 to litres

Examples (a) Change 2000 cm^2 to litres

Solution: $1000cm^3$ = 1 litres
$1\ cm^3$ = $\left(\frac{1}{1000}\right)$ Litres

$2000cm^3 = 1 \times \frac{2\cancel{000}}{1\cancel{000}} = 2$ litres

(b) Change $3700cm^3$ to litres

$1000cm^3 = 1$ litres

$1\ cm^3 = \left(\frac{1}{1000}\right)$ litres

$3700cm^3 = \frac{1}{1\cancel{000}} \times \frac{37\cancel{00}}{10} = \frac{37}{10} = 3.7$ litres

Activity

Pupils will do exercise 13.44, No 1 – 10 on page 364 of A New MK pupils BK 6 (New edn)

Remarks

LESSON 24

Subtopic: Capacity

Content: Conversion of ml to litres

Example: (a) Change 3500 ml to litres

Solution

$1000ml = 1$ litre

$1\ ml = \left(\frac{1}{1000}\right)$ litres

$3500ml = \left(\frac{1}{1000} \times 3500\right)$ litres

$\frac{35}{10} = 3.5$ litres

(b) Express 900 ml as litres.

$1000ml = 1$ litre

$1\ ml = \left(\frac{1}{1000}\right)$ litres

$900ml = \left(\frac{1}{1\cancel{000}} \times 9\cancel{00}\right)$ litres

$\frac{9}{10} = 0.9$ litres

Content: Conversion of litres of ml

Example: (a) Change 5 litres to ml.

1 litre = 1000ml

5 litres = (1000 x 5) ml

= 5000 mls

(b) Change 0.25 litres to ml

1 litre = 1000ml

0.25 litres = (0.25 x 1000) ml

$= \frac{25}{100} \times 1000$

= 250 ml

(c) Change 3 ½ litres to ml

1 litre = 1000ml

3 ½ litres = 1000 x 3 ½

$\frac{7}{\cancel{2}} \times \frac{\overset{500}{\cancel{1000}}}{}$

$= 7 \times 500$

$= 3500ml$

Activity

Pupils do exercise 13.42 No 1 – 16 on page 362 of a New MK pupils Bk 6 (New ed)

Remarks

MEASURES QUESTIONS

Set I

1. What is the cost of 250g of sugar at shs 2000 per kg?
2. A man watched a television for 900 seconds. For how many hours did he watch the television?
3. How many hours are between 3.30am and 2.30pm?
4. A victory party started at 8.40 am and ended at 11.15pm. How long did it take?
5. If the exchange rate is US $ 1 to Ushs 1750. How many dollars can I get from U hs 85,500?
6. A businessman bought a radio at shs 450,000 and sold at shs 500,000. calculate his profit.
7. If I sell an article at shs 120,000 making a profit of shs 5000. how much did I pay for the article?
8. Calculate the loss made by a trader buying an article at shs 10000 and selling it at shs 9050.
9. A man had shs 5000 and bought the following items:
   - 2kg of sugar at shs 1200 per kg
   - 500gm of salt at shs 400 per kg

- 3 bars of soap at shs 2100.

Calculate his total expenditure and balance.

Set 2

1. Find how many notes are in a bundle of notes numbered from AP 627400 to AP 27499.
2. How many 100 shilling coins are equivalent to twenty thousand shillings note?
3. A bus covered a distance of 60 km in 45 minutes. What was its speed?
4. Jinja is 148 km from Mbale through Iganga. The distance from Jinja to Iganga is 39km. How far is Mbale from Iganga?
5. A car travels at 96km/hr for 20 minutes. Calculate the distance travelled?
6. Two towns A and B are 420km apart. A driver travels from A to B at 7 kph and returns at 105 kph. Calculate his average speed for the whole journey.
7. Mwanani covers a distance of 180km in 3 hours. Calculate the speed in m/sec.
8. Katoke traveled to Kenya with K shs 25000 and then to German with Euros 2000. Find the total amount of money in Uganda shillings that he travelled wih if K shs 1 = U shs 22 and Euro 1 = Ug shs 1520.
9. How much money is contained in a 5000 shilling note bundle numbered from VU 28504 and VU 285140?

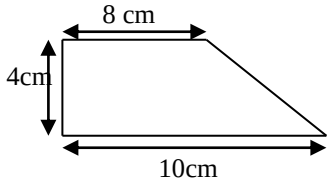
Set 3

1. How many seconds are in 35 minutes?
2. Express 3.30 p.m to 24 hour clock.
3. Change 18000 seconds to hours.
4. Mugisha reached school at 8.15am and left the school at 5:30 pm how long did she stay at school?
5. What distance will be covered at a speed of 20 m/sec for 5 minutes?
6. How long will a car take to cover a distance of 180km at a speed of 60 km/hr?
7. Change 40m/sec to km/hr
8. 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.
9. A parent bought the following articles for the children at beginning of the term.
   - a dress at shs 5500
   - a shirt at shs 3000
   - 2 pairs of shorts at shs 3500 each.
   - Two pairs of shoes at shs 8000 each

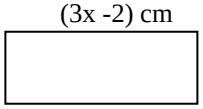
   If the parent had shs 50000. calculate his total expenditure and balance.

Set 4

1. Express 6km as metres.
2. One side of a regular hexagon is 8 cm. What is the total distance round it?
3. A triangular field has a base of 15m and its height 12m. what is the area of the field?
4. Calculate the circumference of a round table top whose diameter is 1.4m?
5. Calculate the area of the figure below.

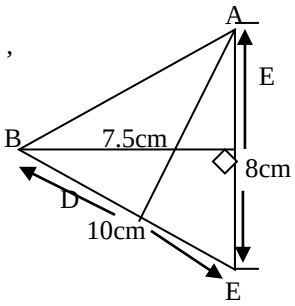


6. A barrel of oil has a radius of 0.5m. calculate its diameter in centimetres.
7. The diagram below is a rectangle ABCD.



(i) Find the value of x.
(ii) Find the area of the rectangle
(iii) Find its perimeter

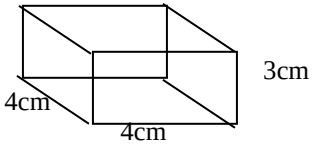
8. ,



(i) Find the length of AD
(ii) Find the perimeter of the Triangle ABC

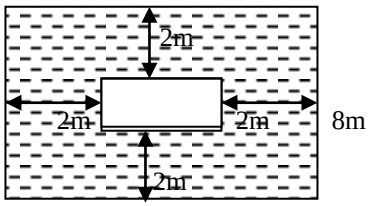
Set 5

1. Express 2 ½ litres as milllitres.
2. Write 15000 cm^3 as litres.
3. Find the volume of the figure below.



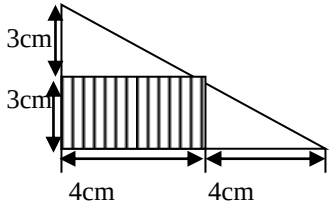
4. A field is 40m^2. what is the area is cm^3
5. A road is 8 km long. What is this distance in metres?

6. ,



(i) Find the width of the inner rectangle
(ii) Find the area of the shaded part

7. Find the area of the shaded part in the diagram below



8. Change 6.045kg to grams.
9. A square room is 3.6 m long. What is its area?
10. Find the height of triangle whose area is $30cm^2$ and its base is 12cm.

THEME: Geometry
Topic: LINES , ANGLES AND GEOMETRIC FIGRUES

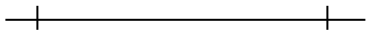
UNIT 9

LESSON 1

Subtopic: Shapes

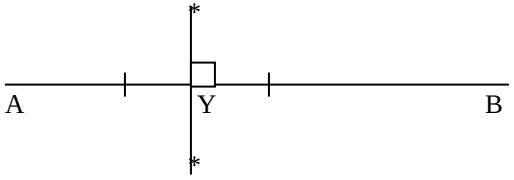
Content:
(i) Types of lines
(a) line, line segment, ray, curves
(b) perpendicular lines
(c) parallel lines
(d) Drawing line
e) Skew lines

Examples:
(a) Draw a line segment of 4.8 cm

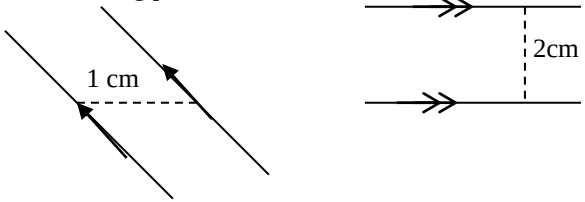


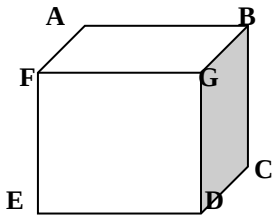
N 4.8cm M

(b) Draw a perpendicular line to AB at Y



(c) Drawing paralle lines





line AB and GD are skew lines

Activity:

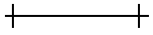
Draw the following:

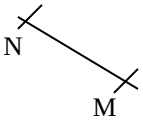
(a) line segment of length

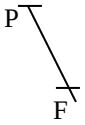
(i) 3.2 cm (ii) 5 cm (iii) 6.7 cm (iv) 10cm

(b) Draw lines perpendicular to:

(i) (ii) (iii)







(c) Draw a parallel lines which are apart by

(i) 2cm (ii) 3cm (iii) 4cm (iv) 1.5cm and 2cm

Remarks

Fountain pg 152-153

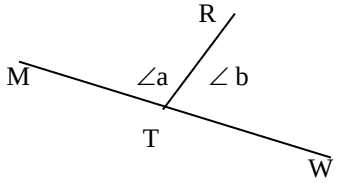
LESSON 2

Subtopic: **Angles**

Content: - Formation and naming angles

- measuring and drawing angles using a protractor

Example: (a) study the figure below



∠ a is MTR or RTM

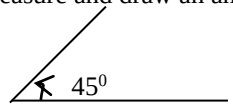
angles b is RTW or WTR

(b) Measure each angle in degrees:

angle "a" = 102^0

angle "b" = 78^0

(c) Measure and draw an angle of 45^0.



Activity

(i) Draw the following angles using a protector

20^0 30^0 80^0 120^0 100^0 65^0 35^0 45^0 72^0

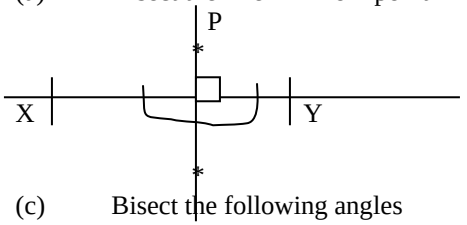
Remarks

LESSON 3

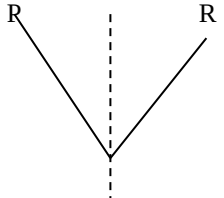
SUBTOPIC: Bisecting line segments and angles

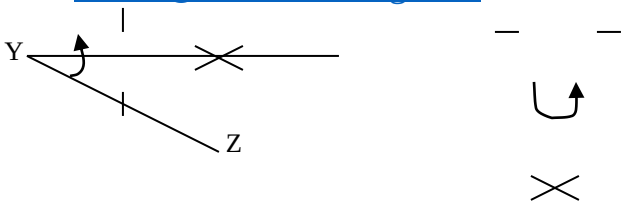
Content: - Bisect lines at a point.
- Drop bisector from a point
- Bisect given angles.

Example: (a) Bisect the line XY from point P



(c) Bisect the following angles





Content: Construct angles using a pair of compasses only.

Example: (i) Construct angles using a pair of compasses only
(To be taken constructed by the teacher)
(a) 60^0 (b) 150^0

(ii) (a) 45^0 (b) 30^0

(iii) Construct an angle of 120^0 at point T

Activity
Pupils will do exercise 6 on page 144 from Oxford primary MTC pupils BK 6.
Fountain pg 147

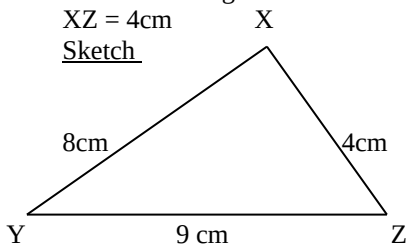
Remarks

LESSON 5

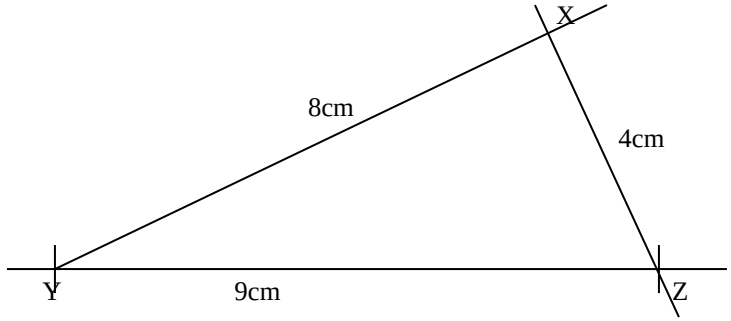
Subtopic: Construction of polygons

Content:
- Types of triangles
- Construction of triangles (SSB) using a pair of compasses And a protractor

Examples: Construct triangle XYZ where the side XY = 8 cm. YZ = 9cm and XZ = 4cm



Accurate



N.B (Emphasize a sharp pencil)

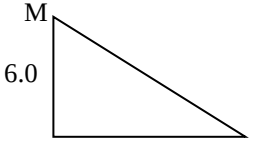
Activity:
A old MK BK 6 pages 288 – 291.
Remarks

LESSON 5

Subtopic: Construction of triangles

Content: Construct triangles involving an angle: (S A S, (SSA), (ASS)
N.B Emphasize the use of sharp pencil)

Example: Use pair of compasses, ruler and pencil only construct triangle KLM with angle KLM = 90^0, side LM = 6.0cm and KL = 8 cm
(b) Measure (a) MK (b) $\angle$ KML
Sketch



90^0
□
L 8cm K
Accurate triangle

KM = 10 cm
∠ KML = 52^0

Activity
Understanding mtc pg 230-231

Remarks
_____

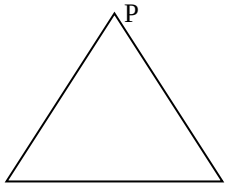
LESSON 6

Subtopic: Construction of triangles

Content: Construct triangle (AAS)

Example: Construct triangle PQR where angle PQR = 30^0, angle PRQ = 60^0 and side QR = 5.8cm
(a) Measure PQ and PR (ii) Measure angle P

Sketch



? ?

30^0 60^0
Q 5.8cm R

Accurate

PQ = 5cm
PR = 2.9cm
∠ P = 90^0

Activity
Understanding mtc pg 230-231
Remarks
_____

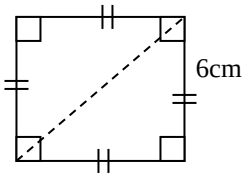
Remarks
LESSON 7

SUBTOPIC: Construction of polygons

Content:
- Construction of quadrilaterals
  (a) square
  (b) Rectangle
  (c) Determine the diagonals
- Their properties

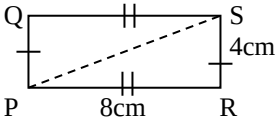
Example: (i) Conolunct a square of side 6cm'
(b) Give the length its diagonals

Sketch



(ii) Construct a rectangle PQRS such that PR = 8cm and RS = 4cm
Measure its diagonal

Sketch



iii) construct a square in a circle

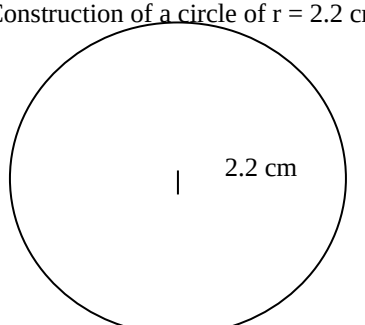
Activity
The pupils will do exercise on construction of squares and rectangles:
Tr's collection
Remarks

LESSON 8

SUBTOPIC: construction of polygons

Content: A regular Hexagon in a circle
N.B Accuracy in measuring radii

Example: (i) Construction of a circle of r = 2.2 cm



(ii) Construct a regular hexagon of side 4cm

EMPHASIZE ACCURACY

(b) Find its perimeter
P = 6 x side
= 6 x 4 cm
P = 24 cm

Content:
- Construction of regular hexagon from centre angles
- Construction of a regular octagon

Examples: A regular hexagon from centre angle.
Centre $\angle = \frac{360}{6 \text{ sides}} = 60^0$

(ii) regular octagon of side = 1.5 cm
$\frac{360}{8} = 45^0$

Activity
Fountain pg 155-156
New mk 165
Remarks

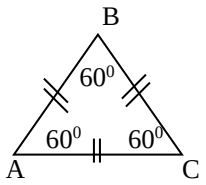
LESSON 9

Subtopic: properties of triangles and quadrilaterals.

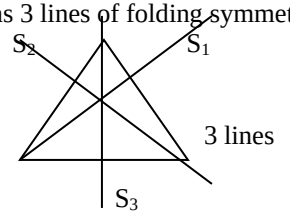
Content: Properties of:
(a) Triangles (Equilaterals, scalene, isosceles and right angled triangle
(b) square
(c) Rectangle

Examples: (a) properties of triangles

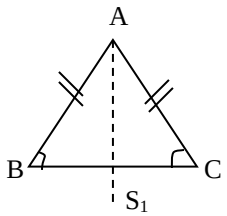
(i) Equilateral



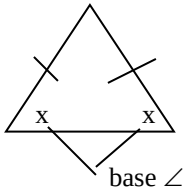
- 3 equal side
AB = AC = BC
Each int ∠ = 60^0
Has 3 lines of folding symmetry



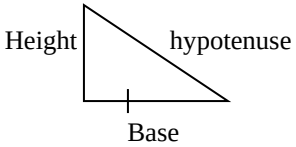
(ii) Isosceles triangle



- 2 equal sides (AB = AC)
- one line of folding symmetry
- 2 base ∠ s are equal

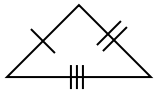


(iii) Right angled triangle



- one Int ∠ = 90^0 (right angle)
- longest side is Hypotenuse
- Int ∠ sum = 180^0

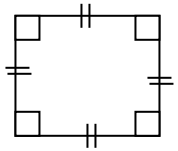
(iv) Scalen triangle



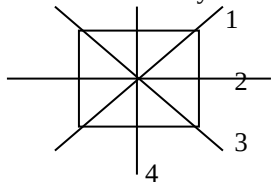
- Has all 3 sides not equal
- No line of symmetry
- Int ∠ s add to 180^0

(b) Properties of quadrilaterals

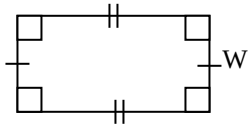
(i) Square



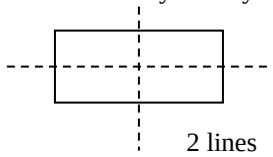
- All 4 sides equal
- Each Int ∠ = 90^0
- Int ∠ sum = 360^0
- Has 4 line of symmetry



(ii) Rectangle



- 2 opposite sides are equal i.e ($L_1 = L_2$) ($W_1 = W_2$)
Each Int ∠ = 90^0
Has 2 lines of symmetry



Activity

Pupils make the sketch of the following showing properties

(a)	Equilateral triangle	(b)	Isosceles triangle
(c)	scalen triangle	(d)	Right angled triangle
(e)	square	(f)	rectangle

Remarks

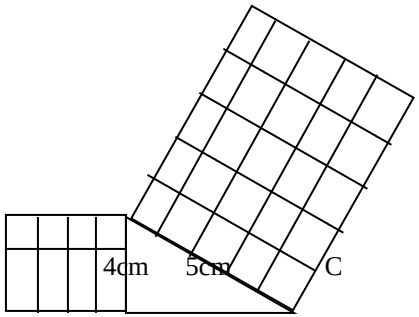
Ref: tr's collection

LESSON 10

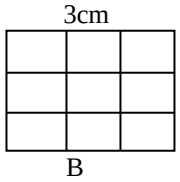
Subtopic: Pythagoras theorem

Content: Use the Pythagoras theorem to find
(a) Hypotenuse
(b) Height
(c) Base

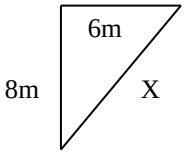
Examples



Sq A + sq B = sq 6
16 sqa + 9 sqs = 25 sq
i.e Base ^{2} + height ^{2} = Hypotenuse^2

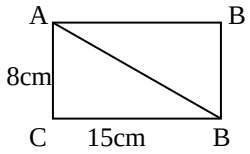


(ii) Find X



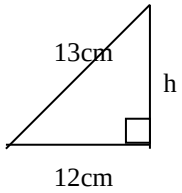
$(6m)^2 + (8m)^2 = x^2$
$(6m \times 6m) + (8m \times 8m) = X^2$
$36m^2 + 64m^2 = X^2$
$\sqrt{100m^2} = \sqrt{X^2}$
$= 10m = x$

(iii) Find AB



$15cm^2 + 7cm^2 = AB^2$
$225cm^2 + 649cm^2$
$\sqrt{289cm^2} = \sqrt{AB^2}$
$17\ cm = AB$

(iii) Find the height



$h^2 + 12cm^2 = 13cm^2$
$h^2 + 144cm^2 = 169cm^2$
$h^2 + 144cm^2 - 144cm^2 = 169\ cm^2 - 144cm^2$
$25cm^2$
$\sqrt{h^2} = \sqrt{25cm^2}$
$h = 5cm$

Activity
exercise 1 from Oxford primary MTC pupils Bk pages 150 – 151, and Exercise 12:30 MK BK 6 page 295
fountain pg 157

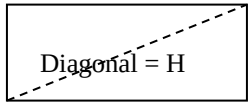
Remarks

LESSON 11

Subtopic: Application of Pythagoras theorem

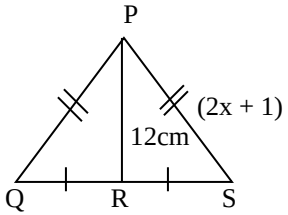
Content: Solve problems using Pythagoras theorem

Example: (i) The flower bed measures 12m by 9cm
Work out the length of its diagonal



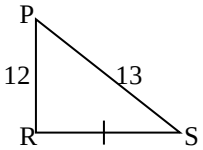
$12m^2 + 9m^2 = H^2$
$144m^2 + 81m^2 = H^2$
$\sqrt{225m^2} = \sqrt{H^2}$
$15m = H$
$\therefore$ Diagonal = 15 m

(ii) The triangle below is Isosceles: PQ = 13cm



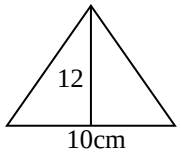
Find X
PS = PQ
(2x +1) = 13cm
2x + 1 – 1 = 13cm – 1
2x = 12 cm
$\frac{2x}{2} = \frac{12}{2}$ cm
X = 6 cm

(b) Find QS



$RS^2 + RP^2 = PS^2$
$RS^2 + 12^2 = 13^2$
$RS^2 + 144 = 169$
$RS^2 + 144 - 144 = 169 - 144$
$\sqrt{RS^2} = \sqrt{25}$
$RS = 5$
$\therefore QS = 5 \times 2$
$= 10$ cm

(c) Find area of PQS



A = ½ x b x h
(½ x 10 x 12) cm^2
½ x 5 x 12 cm^2
Area = 60 cm^2

(d) Work out perimeter
P = QP + PS + QS
= 13cm + 13cm + 10cm
P = 36 cm

Activity
Pupils will do exercise 12:34 page 300 MK pupils BK 6 pages 299 – 300

Remarks

LESSON 12

Email: tekule@tekartlearning.com Website: www.tekartlearning.com

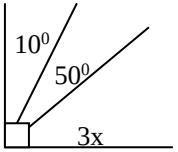
Subtopic: Angle properties

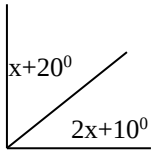
Content:
- Acute, obtuse, reflex, straight, right and centre angles
- Complementary

Example: (i) Describe the angles below

Angle	Description	Reason
50^0	Acute angle	It is $< 90^0 > 0$
124^0	Obtuse angle	It is $> 90^0 < 180^0$
180^0	Straight angle	It is a straight line
280^0	Reflex angle	$> 180^0$ but $< 360^0$
360^0	Centre angle	Forms full circle

(a) Find the value of x

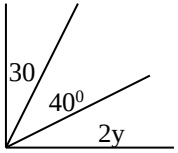




$3x + 10^0 + 50^0 = 90^0$ (complementary ∠s)
$3x + 60^0 = 90^0$
$3x + 60 - 60 = 90 - 60$
$\frac{3x}{3} = \frac{30}{3}$
$X = 10^0$

$x + 20 + 2x + 10 = 90^0$
$x + 2x + 20 + 10 = 90^0$
$3x + 30^0 = 90^0$
$3x + 30\text{-}30 = 90 - 30$
$\frac{3x}{3} = \frac{60}{3}$
$X = 20^0$

(b) If $2y, 40^0,$ and 30^0 are complementary angles, find y.



$2y + 30^0 + 40^0 = 90^0$
$2y + 70^0 = 90^0$
$2y + 70 - 70 = 90 - 70$
$\frac{2y}{2} = \frac{20}{2}$
$Y = 10$

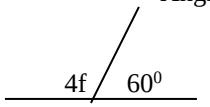
Find complement of $(y\text{-}30^0)$
Ref: fountain 146
MK new edition pg 144
Remarks

LESSON 13

Subtopic: Supplementary angles

Content:
- Angles on a straight line
- Angles on a triangle

Examples:



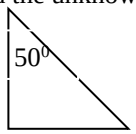
What is f

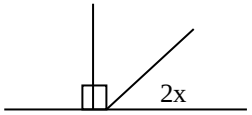
$4f + 60 = 180$
(angles on a straight line add up to 180^0)
$4f + 60 = 180$
$4f = 60 - 60 = 180 - 60$
$4f = 120$
$\frac{4f}{4} = \frac{120}{4}$
$f = 30^0$

(ii) If $2y + 20^0$, $y + 80^0$ and 2y are supplementary ∠ s
Find y
$2y + 200 + y + 800 + 2y = 180^0$
$2y + y + 2y + 20 + 80 = 180^0$
$5y + 100 = 180^0$
$5y + 100 - 100 = 180 - 100$
$\frac{5y}{5} = \frac{80}{5}$
$y = 16^0$

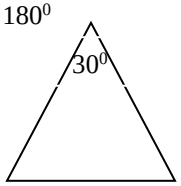
(iii) Interior angles of a triangle add up to 180^0
Find the unknown

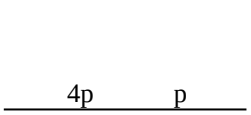
(a)





(b)





$2x + 50^0 + 90^0 = 180^0$
(Int ∠s add up to 180^0)
$2x + 140^0 = 180^0$
$2x + 140 - 140 = 180 - 140$
$\frac{2x}{2} = \frac{40}{2}$
$X = 20^0$

If 4p, 300 and p are angles in a triangle.
Find the value of the unknown
$p + 4p + 30 = 1800$
$5p + 300 = 1800$
$5p + 30 - 30 = 180 - 30$
$\frac{5p}{5} = \frac{150}{5}$
$P = 30^0$

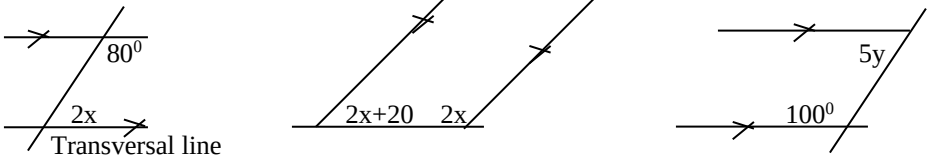
Activity
Exercise 13:12 from page 224 of MK BK 7. page 224 . page 287 from MK BK
Exercise 28:18
New Mk 156
Fountain pg 147
Remarks

LESSON 14

Subtopic: Angles formed by the transversed

Content: The co-interior angles and co – exterior angles

Examples Find the unknown angles



Transversal line

$2x + 80 = 180^0$
(co-int ∠ s add to 180
$2x + 80 - 80 = 180 - 80$
$\frac{2x}{2} = \frac{100}{2}$
$X = 50^0$

$2x + 2x + 20 = 180^0$
(co-int ∠ = 180)
$4x + 20 = 180$
$4x + 20 - 20 = 180 - 20$
$\frac{4x}{4} = \frac{1600}{4}$
$X = 40^0$

$5y + 100 = 180^0$
$5y + 100 - 100 = 180 - 100$
$\frac{5y}{5} = \frac{80}{5}$
$Y = 16^0$

Activity
Exercise 29 : 4 and 29 : 5 of pages 308/9 MK BK 6 pages 308 and 309.

Remarks

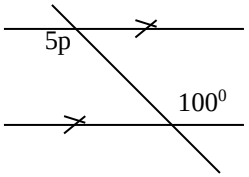
Ref: Mk old edition pg 267-273

LESSON 15

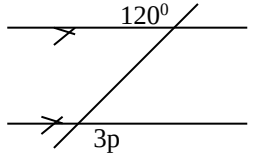
Subtopic: Alternate interior angles

Content:
- Alternate interior angles
- Alternate exterior ∠s
(ARE EQUAL ANGLES)

Examples: Work out the unknown



$5p = 1000$
(Alt. int ∠ s are equal)
$5p = 10^0$



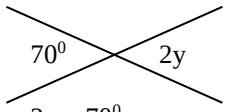
$3p = 120$
(Alternate ext ∠ s are =)
$\frac{3p}{3} = \frac{120^0}{3}$
$P = 40^0$

Subtopic: Corresponding angles

Content:
- Vertically opposite angles
- corresponding angles

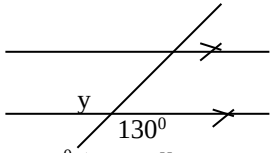
Examples (i) Find the unknown if the given angles are vertically opposites

(a)

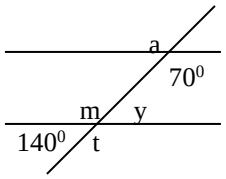


$2y = 70^0$
(vert . opp ∠ s)
$\frac{2y}{2} = \frac{70}{2}$
$y = 35$

(b)



$y = 130^0$ (vertically opp ∠ s)



(ii) Find the missing ∠ s below
a = 70^0 (vert opp)
t = 70^0 (corresponding ∠ s)
a = m (corresponding ∠ s)
∴ m = 70^0
Y = 140^0 (ver opp ∠ s)

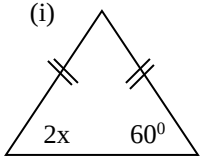
Activity
Pupils will do exercise 24:4 and 29:5 pages pg 267-273
Remarks

LESSON 15

Subtopic: Equal angles

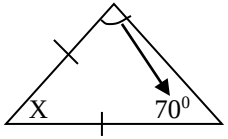
Content:
- Base angles of Isosceles triangle
- 2 interior angle = 1 exterior angle

Example: (i)

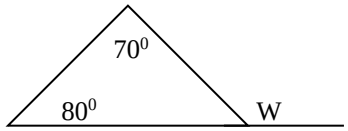


2x = 60
(2 base ∠ s of Isosceles Δ are =)
2x = 60^0
2 2
X = 30^0

(ii)



x + 70 + 70 = 180^0
x + 140^0 = 180^0
x + 140 – 140 = 180-140
x = 40^0



80 + 70 = w
(2 int ∠ = 1 ext + opp ∠)
150^0 = w
W = 150^0

Activity
Old Mk pg 167-273
Remarks

LESSON 16

Subtopic: Exterior and Interior angles

Content:
- Find the exterior angles of regular polygon
- Interior angles of regular polygon

Example: (a) Find the exterior ∠ is 150^0
Ext ∠ + Int ∠ = 180^0
Let ext ∠ be y
Y + 150^0 = 180^0
Y + 150 – 150 = 180 – 150
Y = 30^0

(b) Work out the exterior angle of a regular decagon
Decagon = 10 sides
Ext ∠ = 360 / Sides = 360 / 10 = 36^0
∴ Ext ∠ = 36^0

Activity

Exterior	Interior	Number of sides
X	120^0	_____
_____	_____	5 sides
72^0	_____	5 sides
_____	140^0	9 sides

(b) A regular polygon has 12 sides find its
(i) exterior angles
(ii) interior angles

Remarks
Tr's collection

LESSON 17

Subtopic: Interior angle sum

Content:
- Find interior angle sum of regular polygon
- problems involving interior angle sum

Examples: Find the interior angle sum of a regular hexagon

Int angle sum = (n – 2) x 180
= (6 – 2) x 180^0
4 x 180
Int angle sum = 720^0

(ii) The interior angle of a regular polygon is five times the Exterior angle

(a) Find the ext ∠
Let ext ∠ = x
Ext int
X 5x
6x = 180^0
6 6
X = 30^0

(b) Find the int ∠
int ∠ = 5x
5x = 5x X
x = 300
5 x 30 = 150^0

(c) Find its interior angle sum
Int angle sum = (n – 2) 180
N = 360 / 1 ext ∠ = 360 / 30 = 12 sides
1 ext ∠ sum = (12 – 2) 180
10 x 180^0
= 1800^0

Activity
If the interior angle is thrice the exterior angle of a regular polygon.
(a) Find the exterior angle
(b) How many sides has it
(c) Find its Int angle sum

Remarks
Ref: tr's collection

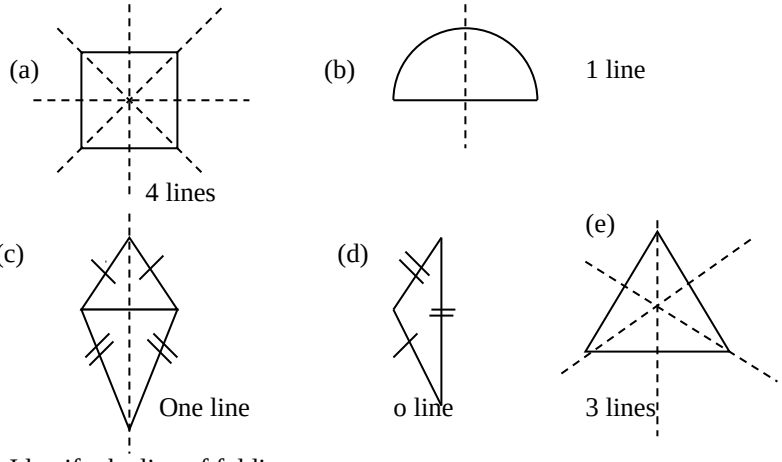
SYMMETRY

LESSON 1

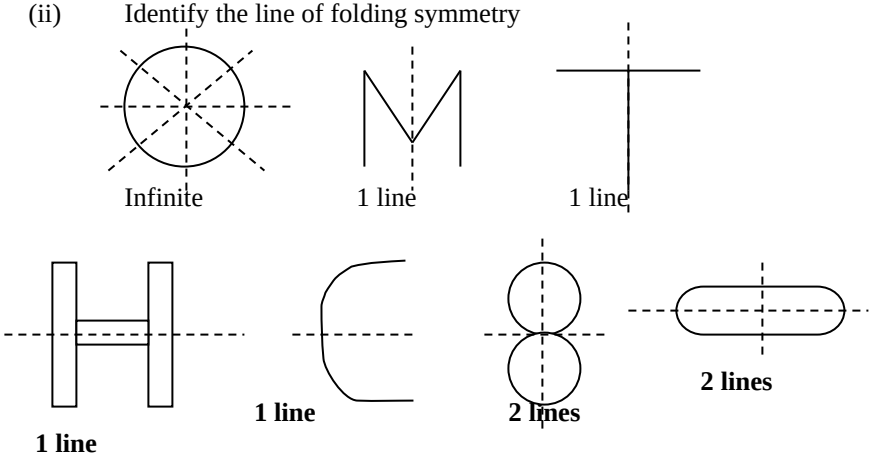
Subtopic: Symmetry

Content: Lines of folding symmetry of plane shapes

Examples: (i) How many lines of symmetry has



(ii) Identify the line of folding symmetry



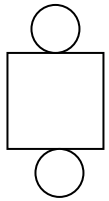
Activity
Pupils will draw and count the lines of folding symmetry of shapes given by the teacher.
Remarks

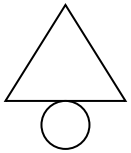
LESSON 2

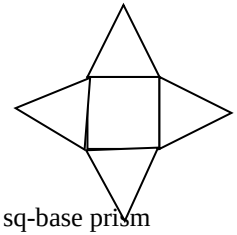
Subtopic: Drawing nets of solids

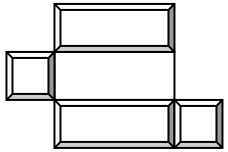
Content:
- Nets of soild objects
- Modes of solids

Example: Name the solid whose net is drawn


Cylinder


cone


sq-base prism


cuboid

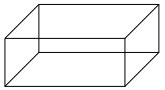
Activity
The pupils will draw sketch nets of
(a) cylinders (b) cones (c) triangular prism
(d) sq-based prism (e) pyramid (f) cube (g) cuboid
Remarks

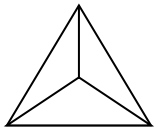
LESSON 3

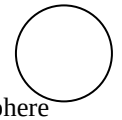
Subtopic: Properties of space objects and their nets

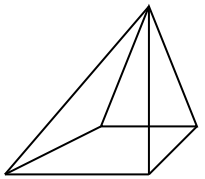
Content:
- Naming solid figures
- Drawing solid shapes.
- The edges, vertices, faces
  i.e edges + 2 = vertices + faces

Examples: Name the shapes


cuboid
has: 12 edges
8 vertices
6 faces


tetrahedron
6 edges
4 vertices
4 faces


sphere


square base prism
8 edges
5 vertices
5 faces

Activity
Pupils will do exercise from Mk Bk 6.
Remarks _____

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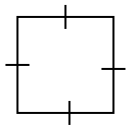
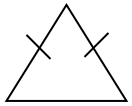
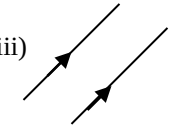
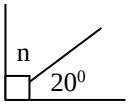
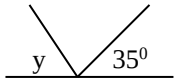
REVISION QUESTIONS ON GEOMETRY

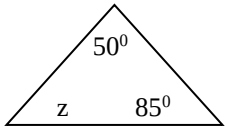
1. Name the following shapes

(i)  (ii)  (iii)  (iv) 

2. Find the unknown angles below

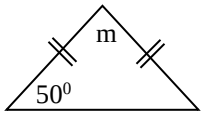
(a) 

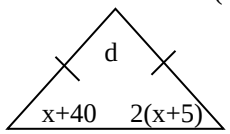
(b) 

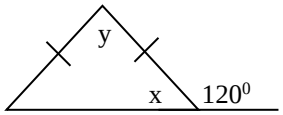
(c) 

3. Find the (a) complement of 15^0 (b) Supplement of 70^0
   (c) If 48^0 is the complement of P. Find P.
   (d) Given that x, 40^0 and 2(x + 5) are supplementary angles. Find the value of x.

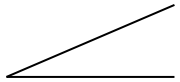
4. What is the value of the unknown?

(a) 

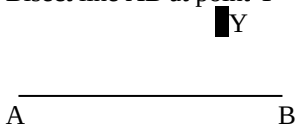
(b) 

(c) 

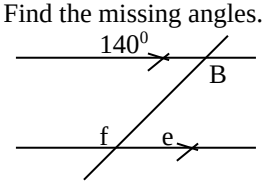
5. Use a pair of compasses, ruler and pencil to:
   (a) construct 45^0 (b) 120^0 (c) Bisect the angle

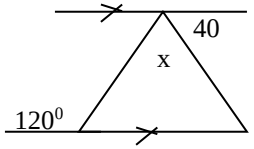


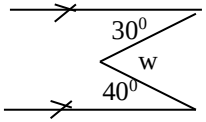
   (d) Bisect line AB at point Y



6. Find the missing angles.





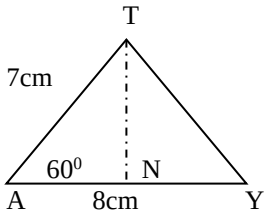


7. The exterior angle of a regular polygon is 40^0.
   (a) How many sides does it have?
   (b) Work out its interior angle.
   (c) What is its interior angle sum?

8. How many lines of symmetry does each of these have.
   N.B Draw and show them
   (a) square (b) isosceles triangle
   (c) Equilateral triangle (d) kite

9. Copy and construct the figure accurately. Drop the perpendicular line to meet AV at N from point T.

Sketch Accurate figure



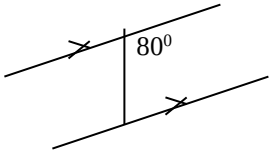
   (b) Measure TN (c) Work out the area of ATY

10. The interior angle of a regular polygon is thrice its exterior angle. Find its interior angle sum.

11. (i) Don faces NE and makes a clockwise turn to face SW. what is the measure of his turn?
    (ii) Draw the shapes: cylinder (b) cube
    (c) triangular prism
    (iii) Draw a net for each solid in (ii) above.

12. Construct triangle XYZ with a pair of compasses such that XY = 7 cm, $\angle$ XYZ = 60^0 and ZXY = 45^0
    (b) Measure XZ (c) $\angle$ XZY

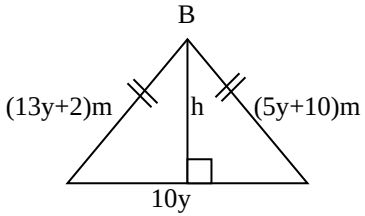
13. Without using a pair of compasses construct angle 50^0



Find the value of y.

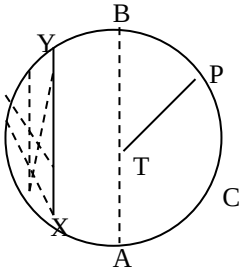
4y

14. What acute angle is between the hour and minute arm of a clock at 6: 15 pm
15. Use a pair of compasses to construct the following.
    (a) Rectangle TOPE where TP = 8cm, PO = 6cm and measure its diagonal.
    (b) Regular hexagon of side 4.3 cm
16. Calculate the length of a rectangle whose width is 7cm and a diagonal of 25 cm.
    (b) Find its (i) Area (ii) perimeter
17. Use the triangle ABC to answer questions below



    (a) Find the value of y.
    (b) What is the length of each side
    (c) Find the value of h
    (d) Calculate the area of ABC
    (e) Find her perimeter

18. The interior angle of a regular polygon is 120 more the exterior angle.
    (a) Calculate its exterior angle
    (b) Find its interior sun
    (c) How many sides has the polygon and name it.
19. Name the parts



    (i) Line TP
    (ii) line AB
    (iii) Line XY
    (iv) curve C
    (v) shaded part

UNIT 7 INTEGERS

UNIT / TOPIC

LESSON 1

Subtopic: Integers on a number line

Content:
- Describe integers
  - (i) Positive
  - (ii) Zero (neutral integer)
  - (iii) Negative
- Opposites/inverses of integers
- Inverse property

Example: (i) Write down the inverse of:

(a) $^{-}4$

Inverse is $^{+}4$

(b) What is the additive inverse of $^{+}5$

Let inverse be x

But $x + {}^{+}5 = 0$

$X + 5 - 5 = 0 - 5$

$X = {}^{-}5$

Inverse $= {}^{-}5$

(c) Work out: (Use inverse property)

$+ 6 - 6$

N.B An integer plus its opposite gives zero.

i.e $^{+}6 - 6 = 0$

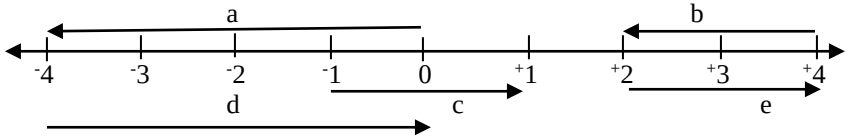
(b) $-3t + 3t$

Answer is 0

Subtopic: Represent Integers using arrow.

Content:
- Name arrows on number lines
- Draw arrows to represent integers

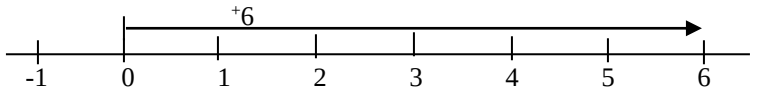
Examples: (a) Which integers is represented by each arrow?

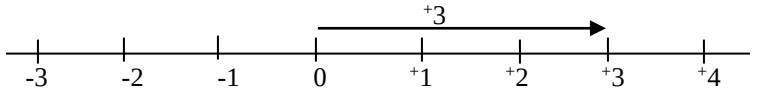


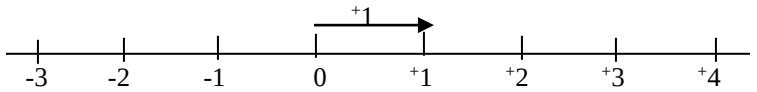
(a) a = $^{-}3$ b = $^{-}2$ c = $^{+}2$ d = $^{+}4$ e = $^{+}2$

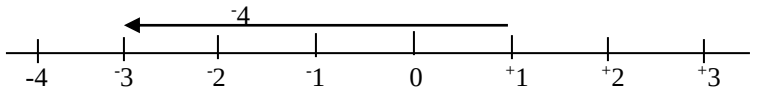
(b) Draw a number line showing each of:

(i) $^{+}6$ (ii) $^{+}3$ (iii) $^{+}2$ (iv) $^{-}4$









Activity

The pupils will do exercise 9:4 on page 196 from A New MK BK 6 page 196.

Remarks

_____

LESSON 2

Subtopic: Ordering integers

Content:
- Compare integers
- Arrange in ascending order
- Arrange in descending order

Examples: (i) **Use >, < or = to compare**

(a) $^{+}2$ ---------- $^{-}2$
$^{+}2 > {}^{-}2$

(b) $^{-}20$ ------- $^{+}11$
$^{-}20 < {}^{+}11$

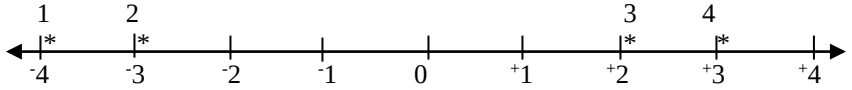
(c) 0 ------- -4
$0 > {}^{-}4$

(d) $^{-}100$ ----- 0
$^{-}100 < 0$

(e) -y --- $^{+}$ y
<

(f) 12 ----- $^{+}12$
=

(ii) Arrange $\{^{-}2, 3, ^{-}3, 2\}$ in ascending order



Order: $\{^{-}3, ^{-}2, 2, 3\}$

(iii) Put $\{^{-}12, ^{-}20, ^{-}34, 0, 6\}$ in descending order
3^{rd} 4^{th} 5^{th} 2^{nd} 1^{st}
Order is $\{6, 0, -12, ^{-}20, ^{-}34\}$

N.B Integers on the right are greater and all those on the left one less.

Activity
The pupils will do exercise 9:7 from page 197 from A New MK pupils' BK 6 page 197.

Remarks

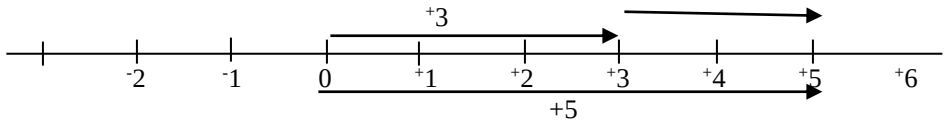
LESSON 3

Subtopic: Operation on integers

Content: Addition of
- (i) Positive integers
- (ii) Positive and negative integers
- (iii) Negative and negative integers

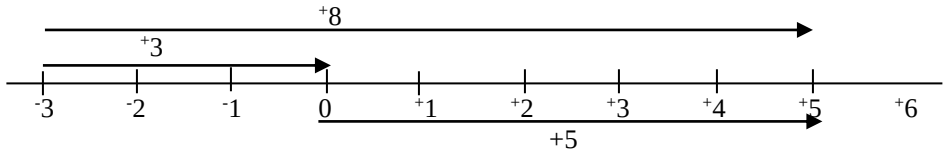
On a number line
- Write sentences of addition on number lines.

Examples: (a) Add $^{+}3 + {}^{+}2$



$\therefore {}^{+}3 + {}^{+}2 = {}^{+}5$

(c) $-3 + {}^{+}8 =$



$\therefore {}^{+}3 + {}^{+}2 = {}^{+}5$

Operation on integers

Content: Addition of integers

Examples: (i) Add: $^{+}6 + {}^{-}6$ (inverse)
$+ 6 - 6$
$= 0$

(b) $+5 + + 2$
$= {}^{+}7$

(ii) $-2y + {}^{+}2y$
Means
$^{-}2y + 2y$
$= 0$

(c) $^{+}8 + {}^{-}4$
means
$^{+}8 - 4 = {}^{+}4$

(d) $-12 + - 16$
$= {}^{-}28$

Activity
The pupils will do exercise 9:8, 9:9, 9:10 on page 198. A New primary MTC BK 6 pages 198.
Ne wmk 168-170

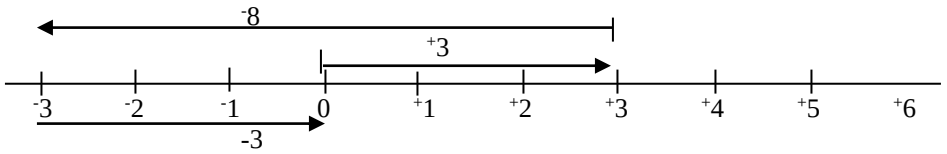
Remarks

LESSON 4

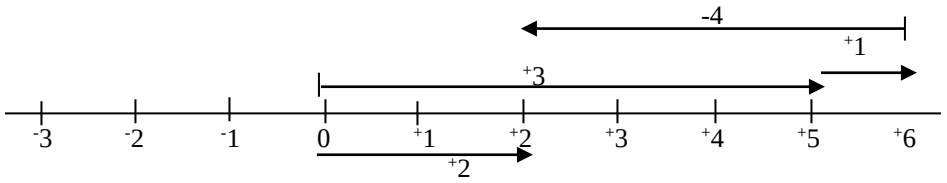
Subtopic: Operations on integers

Content: Subtraction on number line

Example: (i) Write the subtraction sentences gives



Sentence: = $^{+}3 - 8 = ^{-}3$



Sentence: $^{+}5 + ^{+}1 - 4 = ^{+}2$

SUBTOPIC: Operations on integers
Content: Subtraction of integers:
Examples: (i) Work out: (Use the inverse of 2nd integer in qn (ii)

(a) $7 - 5$ = 12

(b) $^{+}7 - ^{+}5$ means $+7 - 5$ = 2

(c) $^{-}7 - ^{+}5$ means $-7 - 5$ = $^{-}12$

(ii) Evaluate

(a) $4 - ^{-}2$ Means 4

(b) $+7 - (^{-}3)$ inverse is $^{+}3$ $^{+}7 + 3$ = $^{+}10$

(c) $-8 - (^{-}10)$ inverse is $^{+}10$ $^{-}8 + 10$ = $^{+}2$

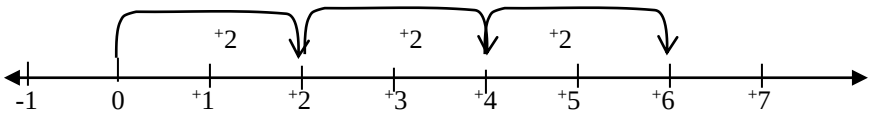
Activity
The pupils will do exercise 9:12, 9:13 without using a number line.
A New MK Bk 6 pages 171-175
Old mk 201
Remarks

LESSON 5

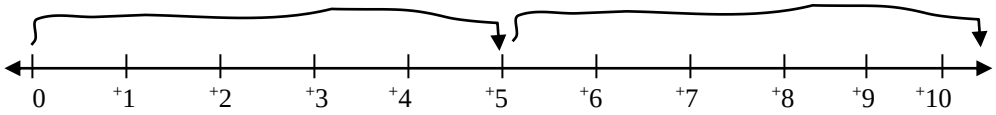
Subtopic: Operations on integers

Content: Multiplying integers on a number line
+ x + = + + x - = - - x - = + - x + = -
Without a number line.

Example: (i) Show: +3 x – 2 below (3 groups of 2)

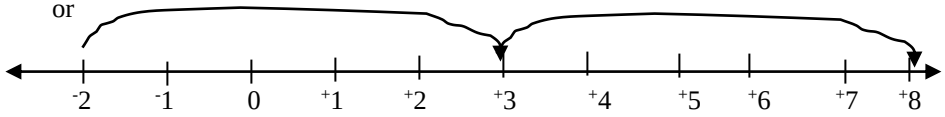


$\therefore\ ^{+}3 \text{ X } ^{+}2 = ^{+}6$



$^{-}2 \text{ x } - 5 = ^{+}10$

or



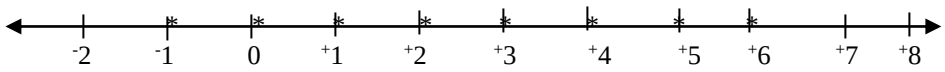
Activity
Pupils will do exercise 12:14 page 112 from A New Mk 2000 BK 6 page 112.
Tr's collection
Old mk 205
Remarks

LESSON 6

Subtopic: Sets on a number line.

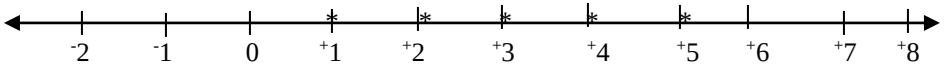
Content:
- Interpreting sets of integers on a number line.
- Representing sets of integers on a number line.

Examples: (i) Write the set y shown below.



Set Y = {$^{-}1$, 0, $^{+}1$, $^{+}2$, $^{+}3$, $^{+}4$, $^{+}5$, $^{+}6$, ---------)

(ii) Find set P



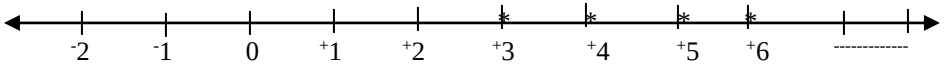
Set P = {+1, +2, +3, +4, +5}

(iii) Find the set shown

Subtopic: Find the solution sets.

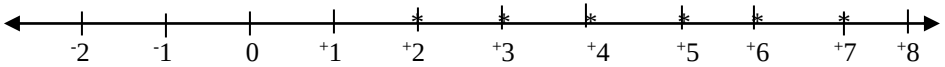
Content: Give the solution sets using a number line.

Examples: (i) If X > 2 find possible values of X



X = {+3, +4, +5, +6, ----------)

(ii) If X ≥ 2 find the solution set for X.



X = {2, 3, 4, 5, 6, 7, ----------}

Activity
The pupils will do exercises 13:3 and 13: 4 page 115.
A new MK BK 6 (Old Edn)
Old mk 207

Remarks

LESSON 7

Subtopic: Inequalities

Content:
- Solve inequalities
- Find solution sets.

Example: (a) Solve 2x > 8

Soln: $\frac{2x}{2} > \frac{8}{2}$

$\underline{X > 8}$

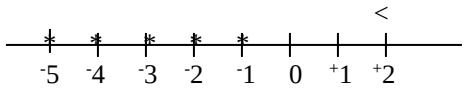
(b) Solve and give the solution set:

3x + 2 < 8

3x + 2 – 2 < 8 – 2

$\frac{3x}{3} < \frac{6}{3}$

$\underline{X < 2}$



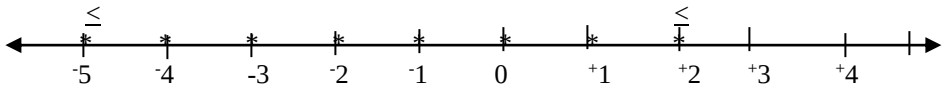
Solution set

X = {------ -3, -2, -1, 0 +1}

(c) Solve: -10 < 2x < -4

$\frac{-10}{2} \leq \frac{2x}{2} \leq \frac{-4}{2}$

-5 ≤ x ≤ 2



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

Ref: old Mk pg 210

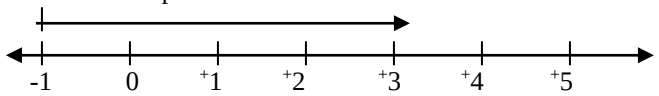
REVISION WORK ON INTEGERS

1. Evaluate
   (a) 8 - - 3 (b) - 9 – 6
   (c) Decrease +7 by - 7
2. Work out:
   (a) - 3 x 0 (b) 0.8 x (-4)
3. Use a number line to add:
   (a) -6 + 4 (b) 4 - + 7
   (c) Find the additive inverse of +6.

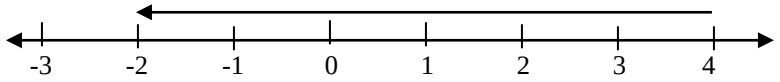
(d) Add: $^{-}6 + 6$ (e) $^{+}14 - 14$

4. Work out:
   (a) $^{+}8 - {}^{-}8$ (b) $^{-}10 - {}^{+}15$ (c) $^{+}9 \div {}^{+}3$
   (d) $^{-}6 \times {}^{+}2$ (e) $^{-}12 \div {}^{-}3$
5. The temperature of ice fell from -3^0C by 5^0C. Find the temperature of ice.
   (b) Umeme men are to plant an electric pole 650cm. If 80 cm goes below the ground level. What is the height of the pole seen?
6. Write the expression shown on the number line

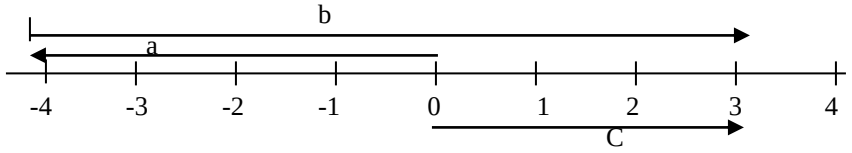
(a)



(b)



(c) Give the sentence shown



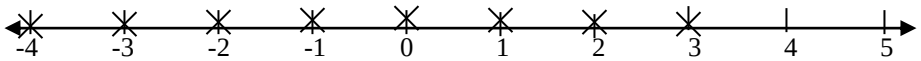
a = _____ b = _____ c = ____

sentence: _____

(ii)

_____ x _____ = _____

7. Solve: $2y > 4$ and give the solution set.
   (b) Give a set of integers for which: $2x + 3 \geq 5$
   (c) Find the set T shown below



(d) Represent W = {$^{-}3$, $^{-}2$, $^{-}1$, 0 $^{+}1$, $^{+}2$, $^{+}3$, $^{+}4$} on a number line

8. (a) Solve for X in $^{-}3x + 5 < 8$
   (b) Find the sum of $^{-}2$ and 12.
   (c) Temperature on top of a mountain is 30^0 at noon. It drops by -10^0C. What is the new temperature?
   (d) Find **r** if $(^{-}2) + \mathbf{r} = 0$
9. (a) If X = {even numbers between 10 and 20}. Find the solution set of $10 < x < 20$.
   (b) Jie walked 4 metres. He remembered he had left some money behind and made 7 steps back to pick the money. Show it on a number line.
   (c) I think of a number, multiply it by 3 and subtract 4 from it, the answer is greater than 14. Find the number.
10. Simplify: $\frac{2}{3} \times 6$ (b) $^{-}2\,(^{-}y + 1)$
    (c) Solve: $3 \geq 3x \geq 9$ (d) $-4p \leq {}^{-}8$
11. Add: (a) $^{+}20 + {}^{-}8$ (b) $^{-}8 + -20$ (c) $^{+}8 + {}^{+}60$
12. Arrange the following integers.
    (a) {$^{-}2$, 4, 8, 3, $^{-}1$, 0} in ascending order
    (b) {$^{+}10$, $^{-}15$, 3, 9, 0, $^{-}1$} in descending order
    (c) Use >, < or = to compare.
    (i) $^{-}20$ ---------- $^{+}8$ (ii) $^{-}2$ ---------- $^{-}10$
    (iii) $^{+}4$ ---------- $^{-}400$ (iv) 0 ---------- $^{-}1$
13. $n - {}^{-}3 = 3$ find the value of n.
    (b) What is the sum of $^{-}3y$ and $^{+}7y$?
    (c) Work out y: If y = {prime numbers less than 10}
14. Study the date below:
    ($^{-}2$, $^{+}3$, $^{+}4$, $^{-}2$, $^{-}5$, $^{+}2$)
    (a) Find their mode. (b) Work out their range
    (c) What is the median?
15. A rat climbs a pole of 50 m high. It climbs 10m and slides 2m down. What distance from the ground level will it be after sliding 6 times?

UNIT 10

ALGEBRA

LESSON 1

Sub-topic: Algebraic Expressions

Content: Writing phrases for Algebraic expressions by
(i) adding (ii) subtracting
(iii) multiplying (iv) dividing

Examples:
(1) Add b to a = a + b
(2) Add 5 to n = n + 5
(3) Subtract b from a = a – b
(4) Subtract 5 from n = n – 5
(5) Multiply b by a = ab
(6) Multiply n by 5 = 5n
(7) Divide b by a = $\frac{b}{a}$
(8) Divide n by 5 = $\frac{n}{5}$

Activity

Pupils will do the following exercises from A New Mk Book 6 pages 374 and 375
14 :1, 14:2, 14:3, 14:4 and 14:5
Fountain pg 187

Remarks

LESSON 2

Subtopic: Substitution

Content:
1. Expanding Algebraic terms
2. Substitution

Examples: (a) Expand the following
1. $2p = 2 \times p$
2. $3pq = 3 \times p \times q$
3. $4q^2 = 4 \times q \times q$
4. $(4q)^2 = 4q \times 4q$

(b) Substitute and find the value of the given expressions below.

(i) Given b = 6
Find: b + 8
6 + 8
= 14

(2) If p = 8, q = 6, a = 2
what is pqa
pqa = p x q x a
= 8 x 6 x 2
= 96

3. Given b = 6, c = -3, a = 2
Find $\frac{bc}{a} = \frac{b \times c}{a}$

$= \frac{\overset{3}{\cancel{6}} \times -3}{\cancel{2}^{1}} = \frac{3 \times -3}{-9}$

Activity:
Pupils do exercises 14:6 and 14:7 from A New Mk Book 6 on page 376
New MK 180-181

Remarks

LESSON 3

Sub topic: Like terms

Content: Collecting and simplifying the like terms

Examples:

1. Simplify:
   r + r + r + r
   = 3r

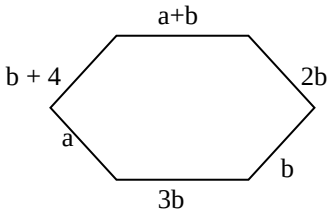
2. Simplify: 3x + 4x + 2x
   7x + 2x
   9x

3. 3h x 3
   3 x h x 3
   = 9h

4. $3x2 \times 4x^2$
   $= 3 \times 4 \times x3 \times 3$
   $= 12x^4$

5. x + y + 2x + 4y
   X + 2x + y + 4y
   3x + 5y

6. 3x + 6y – x – 2y
   3x – x + 6y – 2y
   2x + 4y



= a + b + b + 4 + a + 3b + a + 2b
a + a + a + b + b + 3b + 2b + 4
= 3a + 7b + 4

Activity
Pupils will do the following exercises
14:8, 14:9, 14:10, and 14:11 on pages 377, 378, 379 from A New MK Book 6.
New Mk 182-183

Remarks

LESSON 4

Subtopic: Algebra involving brackets

Content: Removing brackets by:
1. Multiplying every term inside the brackets by the factor outside it.
2. Substituting and finding the values of the unknowns.
3. Changing positive and negative signs involving brackets.
4. Solving and simplifying equations

Examples:

1. Remove the brackets
   2 (a + 3) = (2 x a) + (2 x 3)
   = 2a + 6

2. If b = 1 and c = -3
   find: 3b – c
   = (3 x b) – c
   = (3 x 1) – 3
   = 3 – 3 = 0

3. – (2x – 2y)
   - 2x (-- 2y)
   = - 2x + 2y

4. ½ (8a + 4b)
   = (½ x 8a) + (½ x 4b)
   = 4a + 2b

5. 3 (x + 3) – 2 (x – 1)
   3x + 9 – 2x + 2
   3x - 2x + 9 + 2 =
   x + 11

Activity:
Pupils will do the following exercises 14:12, 14:13, 14:14, 14:15, 14:16 and 14:17 from MK MTC BK 6 pages 380, 387 and 382.
Fountain pg 188-189

Remarks:

LESSON 5

Subtopic: Forming equations

Content: Forming and solving equations involving addition.

Examples:

1. p + 4 = 12
   P + 4 - 4 = 12 – 4
   P = 8

2. Amanda had some pineapples. She bought 6 more pineapples altogether. How many pineapples had she before?

   Let the pineapples be p

Before	more	total
P	6	11

P + 6 = 11 She had 5 pineapples
P + 6 – 6 = 11 – 6
P = 5.

Subtopic: Finding the unknown.
Content: Forming and solving equations involving subtraction.
Examples: 1. Find the value of:
b – 3 = 8
b – 3 + 3 = 8 + 3
∴ b = 11

Activity:
Pupils will do the following exercises: 14:23 and 14:24 on page 386 from A New Mk MTC book 6
New Mk 184-185

Remarks.

LESSON 6

Subtopic: Finding the unknown.

Content: Forming and solving equations involving multiplication

Examples: 1. Solve: $2x = 8$

$\frac{2x}{2} = \frac{8}{2}^{4}$

$X = 4$

2. 4 buses carried y passengers each. Altogether they carried 320 passengers. How many passengers did each bus carry?
Passengers in 4 buses = (4 buses Xy passengers)
4 x y = 320 passengers
$\frac{4y}{4} = \frac{320}{4}$
Y = 80

Each bus carried 80 passengers.

Content: Collect like terms and simplify.

Examples: 1. 3g + g + 2g = 30
6g = 30
6 6
g = 5

Activity:
Pupils will do the following exercises 14: 27 and 14: 28 on page 388 from A New Mk book 6.
MK new edition 186

LESSON 7
Subtopic: forming equations

Musa is twice as old as Anna. Their total age is 18 years.
How old is Anna?
Let Anna's age be x.

Anna	Musa	Total
X years	2x years	18 years

X + 2x = 18 Anna's age is 6 years.
$\frac{3x}{3} = \frac{18}{3}$
X = 6

Activity:
Pupils will do the following exercises 14: 27 and 14: 28 on page 390 from A New Mk book 6.
MK new edition 186

Remarks.

LESSON 8

Subtopic: Finding the unknown.

Content: Equations involving fractions

Examples: (i) $\frac{a}{3} = 4$

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

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

a = 12

2. Find the number of oranges that can be divided among 5 boys, so that each gets 6 oranges.
Let the number of oranges be p

So $\frac{p}{5} = 6$ $\qquad \frac{5}{5} \times p = \frac{6}{1} \times 5$

P = 30

P = 30 oranges

3. Solve: $\frac{5p + 2}{4} = 12$

$\frac{5p + 2 - 2}{4} = 12 - 2$

$4 \times \frac{5p}{4} = 10 \times 4$

$\frac{5p}{5} = \frac{40}{5}$

P = 8

Activity:
Pupils will do exercises 14 : 29 and 14:30 on page 389 from A New Mk MTC book 6.
Old MK 390
New Mk 187

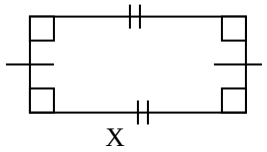
Remarks.

LESSON 9

Subtopic: Application of equations

Content: Forming and solving equations using a perimeter

Example 1. The perimeter of a rectangle is 24cm. Find X.



L + W + L + W = perimeter
X + 4 + x + 4 = 24 cm
X + x + 4 + 4 = 24 cm
2x + 8 – 8 = 24 – 8
$\frac{2x}{2} = \frac{16}{2}$
X = 8 cm

Activity:
Pupils will do exercise 14: 32 on page 395-396 from A New Mk MTC
New Mk 191

Remarks.

LESSON 10

Subtopic: Solving equations involving brackets
Content: Removing the brackets

Examples 1. Solve: 3 (y + 4) = 21
(3 xy) + (3 x 4) = 21
3y + 12 = 21
3y + 12 – 12 = 21 – 12
$\frac{3y}{3} = \frac{9}{3}$
Y = 3

2. Solve: 5(y + 1) – 3(y – 1) = 14
(5 x y) + (5 x 1) – (3 x y) – (-3 x 1) = 14
(5y + 5) – (3y + 3) = 14
5y + 5 – 3y + 3 = 14
5y – 3y + 5 + 3 = 14
2y + 8 = 14
2y + 8 – 8 = 14 – 8
$\frac{2y}{2} = \frac{6}{2}$
Y = 3

Activity:
Pupils will do exercises 14:33 and 14:34 on pages 392 and 393 from A New Mk Bk 6.

Remarks.

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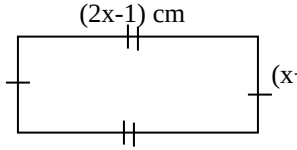
LESSON 11

Subtopic: Application of Algebra

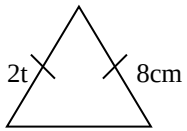
Content: Forming equations and finding the unknown.

Examples: 1.



$2x - 1 = x + 3$
$2x - 1 + 1 = x + 3 + 1$
$2x = x + 4$
$2x - x = x - x + 4$
$X = 4cm$

2.



$2t = 8$
$\frac{2t}{2} = \frac{8}{2}$
$t = 4cm$

Activity:
Pupils will do exercise 14:37 on page 394 from A New Mk book 6.
New Mk 190-191
Remarks.

REVISION WORK ON ALGEBRA

1. (i) Add: m to 6 (ii) subtract 4 from b
   (iii) multiply 2 by t (iv) Divide x by 7

2. If p = 8, r = 4, q = 6, c = 3. Find the value of
   (a) $\frac{p + r}{qc}$ (b) $\frac{pq}{rc}$

3. Simplify: (a) $3x + 6y - x - 2y$ (b) $2x^3 \times 2x^3$

4. Remove the brackets
   (a) $4(1 - 3b)$ (b) $+3x(y - 1)$
   (c) $4(x + 3) + 2(x + 3)$

5. Odoi made some stools, he was given 5 more stools and got 13 stools altogether. Find the number of stools Odoi made.

6. Akiiki harvested some sacks of potatoes, she sold 15 of them and kept 2 for her family. Find the number of sacks she harvested.

7. (a) Solve for m: $13m = 260$
   (b) I think of a number, multiply it by 9. If the result is 108. What number did I think of?

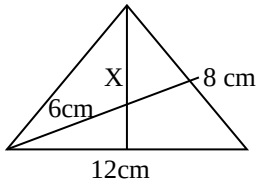
8. A father is 3 times as old as his daughter. Their total age is 48 years. How old is the daughter?

9. The perimeter of the square of side p cm is 28cm, Find P.

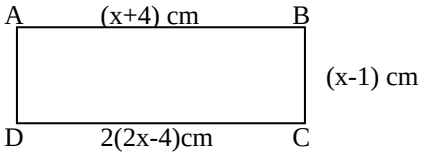
10. Solve: $\frac{5p}{4} = 2 = 12$

11. Solve: (a) $5(y + 1) - 3(y - 1) = 14$
    (b) $5x + 1 = 4x + 4$

12. Find X



13. Figure ABCD is a rectangle.



(i) Find the value of X.
(ii) Find the actual width and length
(iii) Find the perimeter and area of the rectangle.

SYMMETRY

Remarks _____