

## P.6 LESSON NOTES FOR MATHEMATICS

### **TOPICAL BREAKDOWN FOR TERM I**

Theme	Topic	Sub topic			
Sets	Sets concepts	<ul style="list-style-type: none"> <li>• Types of sets</li> <li>- Disjoint sets</li> <li>- Equivalent sets</li> <li>- Non equivalent sets</li> <li>- Equal sets</li> <li>- Union sets</li> <li>- Un equal sets</li> <li>- Matching sets</li> <li>- Intersection sets</li> <li>- Joint sets</li> <li>• Complement of sets</li> <li>• Difference of sets</li> <li>• Sub sets</li> <li>- Listing proper sub sets and improper subsets</li> <li>- Finding the number of sub sets</li> <li>- Application of subsets (finding number of members in a set whose subsets are given) <ul style="list-style-type: none"> <li>• Representing elements on a Venn diagram</li> <li>• Venn diagram</li> <li>- Describing and shading regions of a Venn diagram</li> <li>- Representing members on Venn diagram</li> <li>- Venn diagrams showing number of members in the sets</li> <li>- Application of the set concept</li> <li>• Probability</li> </ul> </li> </ul>			
Numeracy	Whole numbers	<ul style="list-style-type: none"> <li>• Place values up to millions</li> <li>• Values of digits up to millions</li> <li>• Expanding numbers</li> <li>- Place value form</li> <li>- value form</li> </ul>			

		<ul style="list-style-type: none"> <li>- powers of ten (exponents)</li> <li>• Writing numbers in words</li> <li>• Writing numbers in figures</li> <li>• Decimal fractions</li> <li>• Place values</li> <li>• Value</li> <li>• Expanding decimal fractions</li> <li>• Writing in words</li> <li>• Writing in figures</li> <li>• Rounding off decimals</li> <li>• Roman numbers up to M</li> <li>• Roman numerals to Hindu Arabic</li> <li>• Application of Roman numbers.</li> </ul>		
	Numeracy	Operation on whole numbers	<ul style="list-style-type: none"> <li>• Addition of whole numbers with or without regrouping</li> <li>• Addition of whole numbers involving word problems</li> <li>• Subtracting whole numbers with or without regrouping</li> <li>• Multiplication of whole numbers involving word problems.</li> <li>• Division of whole numbers by 2 digit numbers with or without remainders.</li> <li>• Division involving word problems</li> <li>• Mixed operation on whole numbers</li> <li>• Mixed operation involving word problems</li> <li>• Properties of numbers</li> </ul>	
		Pattern and sequences	<ul style="list-style-type: none"> <li>• Divisibility tests of 2,3,4,5,6,8,9,10</li> <li>• Types of numbers <ul style="list-style-type: none"> <li>- Even and odd numbers</li> <li>- Whole and natural numbers</li> <li>- Counting numbers</li> <li>- Triangular numbers</li> <li>- Square numbers</li> </ul> </li> </ul>	

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|--|--|--|--|--|
|  | <ul style="list-style-type: none"> <li>- Prime numbers</li> <li>- Composite numbers</li> <li>• Number patterns</li> <li>• Consecutive numbers</li> <li>- Counting</li> <li>- Even</li> <li>- Odd</li> <li>• Factors of a number</li> <li>- Common factors</li> <li>- Greatest / highest common factor</li> <li>• Prime factorization</li> <li>- Finding unknown prime number</li> <li>- Finding GCF and LCM using prime factors on venn diagrams</li> <li>• Application of GCF</li> <li>• Multiples of numbers</li> <li>• Common multiples and LCM</li> <li>• Application of LCM</li> <li>• Finding square of numbers</li> <li>• Finding square root of numbers</li> <li>• Application of square and square roots of numbers</li> <li>• Forming number patterns</li> </ul> |  |  |  |
|--|--|--|--|--|

## TOPIC / UNIT ONE - SET CONCEPTS

### LESSON 1

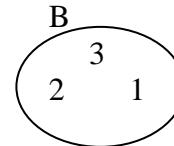
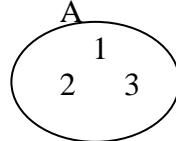
**Sub topic:** - **Types of sets**

**Content:**

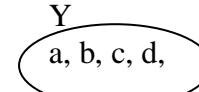
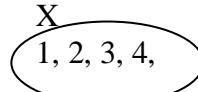
1. Types of sets: (a) Equal sets e.g  
(b) Equivalent sets  
(c) Unequal

**Examples**

1. Equal sets



2. Equivalent sets / matching sets



3. Non equivalent sets

P

a,e,i

Z

1,2,3,4

### 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 ( $\cap$ ) / joint sets  
A set of common members from two or more sets.
- (b) Union sets ( $\cup$ )  
A set of all elements in the two or more sets.
- (c) Universal set ( $\epsilon$ )  
The biggest set from which other smaller sets are got.
- (d) Joint and disjoint sets

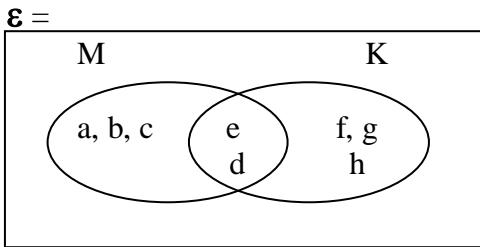
#### Examples

Sets M = {a, b, c, d, e, }

K = {d, e, f, g, h, }

- ∴ (i)  $M \cap K = \{e, d\}$   
(ii)  $K \cup M = \{a, b, c, d, e, f, g, h\}$   
(iii) Universal set ( $\epsilon$ )

The biggest set from sets M and K i.e

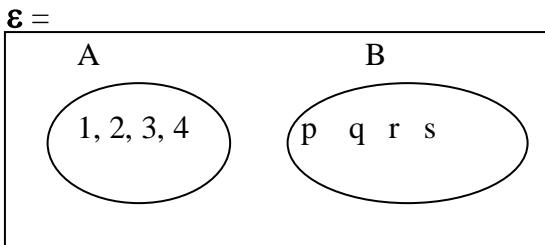


$$\epsilon = \{a, b, c, e, d, f, g, h\}$$

#### Disjoint set

A = {1,2,3,4}

B = {p, q, r,s}



#### Activity

Mk new edition pg 3-4

Understanding mtc pg 4-7

Fountain pg 7-8

#### Remarks

## LESSON 3

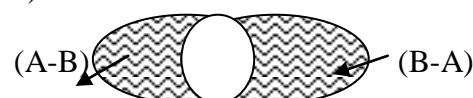
### Sub topic : Types of sets

#### 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

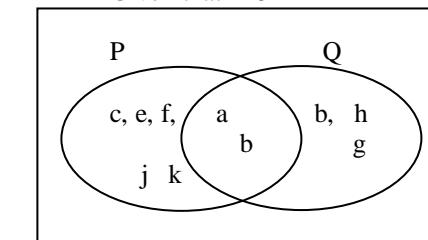
#### Examples:

- a) A                    B



- b) Complements

Given that  $\epsilon$



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

## LESSON 4

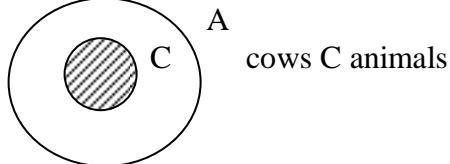
**Sub topics** sub sets ( $\subset$ )

**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)



cows C animals

- (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}

$$\begin{aligned} \text{No of subsets} &= 2^n \\ &= 2^3 \\ &= 2 \times 2 \times 2 \\ &= 8 \end{aligned}$$

- iv) find number of proper subsets

$$(2^n - 1)$$

Set P = {a,b,c,d}

No of proper subsets

$$(2^n - 1)$$

$$2^4 - 1$$

$$(2 \times 2 \times 2 \times 2) - 1$$

16-1

15 proper sub sets

## Activity

Mk new edition pg 6-7

Fountain mtc pg 8-10

Understanding mtc pg 4-6

## Remarks

## 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

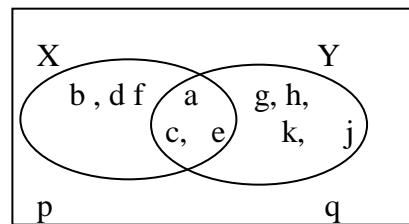
N = {prime numbers between 0 and 10}

N = {2, 3, 5, 7}

(ii)  $n(N) = 4$

(i) Use the venn diagram to answer questions

**e**



Find

(a)  $n(x)$

But  $x = \{a, b, c, d, e, f\}$   
 $\therefore n(x) = 6$

(b)  $n(y)$

(c)  $n(X \cap Y)$

(d)  $n(Y - X)$

(e)  $n(X)^1$

## Activity

Mk old edition pg 20-22

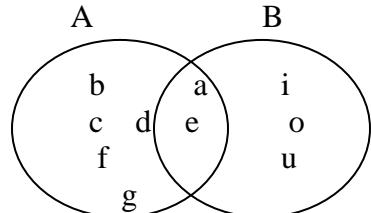
## Remarks

## 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}



$$n(A) = 7$$

$$n(B) = 5$$

$$n(A \cap B) = 2$$

$$n(A - B) = 5$$

$$n(B - A) = 3$$

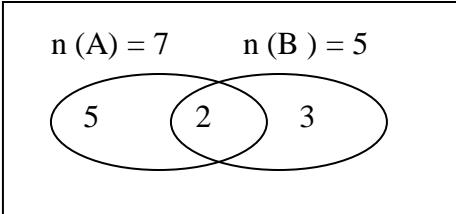
$$n(A \cup B) = 10$$

(b) Interpreting information given on a venn diagram

**Examples:**

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

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



## Activity

Mk old edition pg 22-25

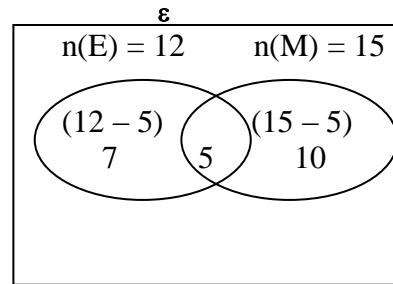
## Remarks

## 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.

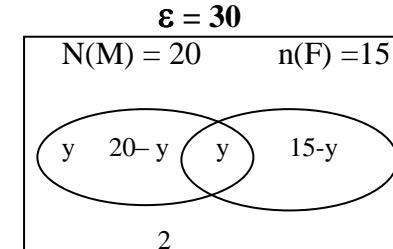


(i) The class has  $7 + 5 + 10 = 22$   
 $\therefore E = 22$  pupils

(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



Let y represent those who take both.

(ii) How many pupils take both drinks?

$$20 - y + y + 15 - y + 2 = 30$$
$$20 - y + 15 + 2 + y - y - y = 30$$

$$37 - y = 30$$

$$37 - 37 - y = 30 - 37$$

$$-y = -7$$

$$-1 = -1$$

$$Y = 7$$

### Activity

- (i) Understanding mtc pg 13-15
- (ii) Fountain p g 10-13
- (iii) Mk new edition pg 8-9

### Remarks

## LESSON 8

**Sub topic** : Probability  
**Content :**

- (i) The idea of probability / chance
- (ii) Formular  

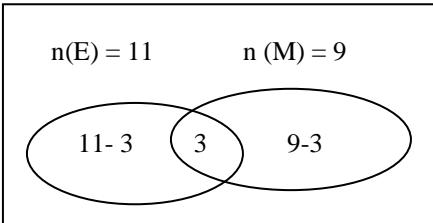
$$\text{Prob.} = \frac{n(\text{Expected outcome})}{n(\text{possible outcomes})} \text{ or } n(\text{EE})$$
- (iii) Application

Example: If  $B = \{\text{counting numbers less than } 10\}$   
 $\therefore B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

(a) Find the probability of picking an even number  
 Even numbers = {2, 4, 6, 8}  
 $n(\text{Expected outcomes}) = 4$   
 $n(\text{possible outcomes}) = 9$   
 $\therefore \text{Prob} = \frac{4}{9}$

(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?

$$\varepsilon = 17$$



Pupils who like both:

$$(11 + 9) - 17$$

$$20 - 17$$

$$3$$

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

### Activity

Fountain pg 14-16  
 Mk new edition pg 10-12  
**Remarks**

## LESSON 9

### Revision work on set concepts

1. Write equal, unequal or equivalent against each

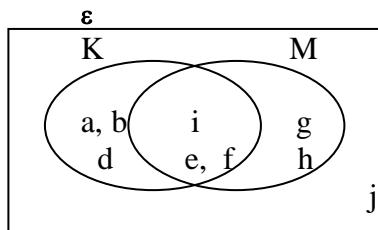
P	Q	R	S
1, 2, 3, 4, 5	1, 3, 9 2, 7, 5	8, 9, 11 7, 2, 1	3, 5, 1, 2, 4

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

2. If  $P = \{\text{even numbers less than ten}\}$

- (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)  $K \cap M$       (iv)  $M \cup K$       (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?

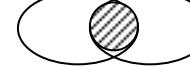
- (c) Given that a set has 16 subsets. Find the numbers elements in this set.

5. (a) Draw and shade these sets.

- (i)  $R \cap P$       (ii)  $M \cup N$       (iii)  $Z - F$

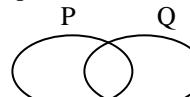
- (b) Describe / name the shaded regions below:

- (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  $n(P \cap Q)$  (ii)  $n(P \cup Q)$  (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	$5 \times 1 = 5$
	Tens	$2 \times 10 = 20$
	Hundreds	$7 \times 100 = 700$
	Thousands	$8 \times 1000 = 8000$
	Ten thousands	$3 \times 10000 = 30000$
	Hundred thousands	$4 \times 100000 = 40000$
	Million	$9 \times 1000000 = 9000000$

- ii) Using operations to find values of digits

##### Activity

Mk new edition pg 14-15

Fountain pg 20-23

##### Remarks

## 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  

$$6845 = (6 \times 1000) + (8 \times 100) + (4 \times 10) + (5 \times 1)$$

$$= 6000 + 800 + 40 + 5$$
- b) Using power exponents  

$$6^3 8^2 4^1 5^0 = (6 \times 10^3) + (8 \times 10^2) + (4 \times 10^1) + 5 \times 10^0$$
  

$$6845 = 6.845 \times 10^3$$

### Activity

MK new edition pg 16-17

Understanding mtc pg 25

Fountain pg 23-24

##### Remarks

## LESSON 3

### Scientific /standard form

**Content**: expanding number using scientific notation

Example: Express 6845 in scientific form

$$\begin{aligned} 6845 &= 6845 \div 10 \\ &684.5 \div 10 \\ &68.45 \div 10 \\ &6.845 \times 10^3 \end{aligned}$$

## 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:

$$\begin{array}{r} 4000 + 60 + 2 \\ 4000 \\ + 60 \\ + 2 \\ \hline 4062 \end{array}$$

- (b)  $(8 \times 10000) + (7 \times 1000) + (5 \times 100) + (9 \times 10) + (3 \times 1)$   
 $80,000 + 7,000 + 500 + 90 + 3$

$$\begin{array}{r}
 80000 \\
 7000 \\
 500 \\
 90 \\
 + 3 \\
 \hline
 87593
 \end{array}$$

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

$$\begin{array}{r}
 6000 \\
 400 \\
 20 \\
 + 3 \\
 \hline
 6425
 \end{array}$$

(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 upto 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

Four hundred thousand, seven hundred sixteen

Solution:

$$\begin{array}{r}
 \text{Four hundred thousand} & 400000 \\
 \text{Seven hundred sixteen} & + 716 \\
 \hline
 400716
 \end{array}$$

ii) One million one hundred one thousand eleven

### Activity

MK new edition pg 18-19

Fountain pg 25.

### Remarks

### LESSON 7

**Subtopic:** Rounding off whole numbers

**Content:** Round off to the nearest

(i) Tens

(ii) Hundreds

(iii) Thousands

Examples: (i) Round 677 to the nearest tens

$$\begin{array}{r}
 677 \\
 + 10 \\
 \hline
 680
 \end{array}$$

(ii) Round 1677 to the nearest hundreds

$$\begin{array}{r}
 1677 \\
 + 100 \\
 \hline
 1700
 \end{array}$$

(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  

$$4 . \underline{6}$$
  
 $| \quad \text{Tenths} - 6 \times \frac{1}{10} (6 \times 0.1) = 0.6$   
 $\text{Ones} - 4 \times 1 = 4$

Number	Place values	Values
6.73	6 – ones	$6 \times 1 = 6$
	7 – tenths	$7 \times \frac{1}{10} = 0.7$
	3 = hundredths	$3 \times \frac{1}{100} = 0.03$

**Activity**  
Mk old edition pg 42-44

**Remarks**

### LESSON 9

- Subtopic:** Reading and writing decimals in words and the vice versa  
**Content:**
- (i) Writing decimals in words
  - (ii) Expressing decimals in figures from words
- Examples:**
- (a) Write 0.125 in words  
 $0.125 = \text{One hundred twenty five thousandths}$
  - (b) 18.4  
 $18 \rightarrow \text{Eighteen}$   
 $0.14 \rightarrow \text{Fourteen hundredths}$   
 $18.14 \rightarrow \text{Eighteen and fourteen hundredths}$
  - (c) Twenty six and four tenths  
Twenty six → 26  
Four tenths → + 0.4  
 $26.4$

**Activity**  
Mk old edition pg 45- 46

**Remarks**

### LESSON 10

- Subtopic:** Expanding decimal numerals  
**Content:**
- (i) Expand using place values
  - (ii) Expand using values
  - (iii) Expand using exponents
- Examples:**
- (i) Expand 3.54  

$$\begin{array}{r} | \\ 3.54 \end{array}$$
  
 $\begin{array}{l} \text{Hundreds} - 4 \times \frac{1}{100} = 0.04 \\ \text{Tenths} - 5 \times \frac{1}{10} = 0.5 \\ \text{Ones} = 3 \times 1 = 3 \end{array}$   
 $\therefore 3.54 = 3 + 0.5 + 0.04$
  - (ii) Expand 4.62 using exponents/  

$$\begin{array}{r} 0 \ -1 \ -2 \\ 4 . 6 \ 2 \end{array}$$
  
 $4.62 = (4 \times 10^0) + (6 \times 10^{-1}) + (2 \times 10^{-2})$
  - (iii) Write as a single numeral  

$$\begin{array}{r} 3 + 0.5 + 0.04 \\ 3 \\ 0.5 \\ + 0.04 \\ \hline 3.54 \end{array}$$
- (b)** Express in the shortest form  

$$\begin{array}{r} (4 \times 10^0) + (6 \times 10^{-1}) + (2 \times 10^{-2}) \\ 4 \times 100 = 4 \times 1 = 4 \\ 6 \times 10^{-1} = 6 \times \frac{1}{10} = 0.6 \\ 2 \times 10^{-2} = 2 \times \frac{1}{100} = 0.02 \\ \hline 4.62 \end{array}$$

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

**Remarks**

### LESSON 11

- Subtopic:** Expressing decimal in scientific notation.  
**Content:** Expend decimals of different place values in standard/ Scientific notation.
- (a) Tenths

- Examples:
- (b) Hundredths
  - (c) Thousandths
  - (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

## LESSON 12

Content: Finding expanded decimals

#### Example

- a) What number has been expanded
- i)  $3+0.5+0.04$
  - ii)  $(4 \times 10) + (6 \times 1) + (7 \times 0.01)$
  - iii)  $(6 \times 10^3) + (4 \times 10^1) + (9 \times 10^{-2})$

#### 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

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

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

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

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

Ascending order = 0.04, 0.1, 2.0

(ii) Arrange the following in descending order

$$3.5, 4.05, 0.45, 0.02$$

$$35, 405, 45, 2 \quad (\text{LCM} = 100)$$

$$10, 100, 100, 100$$

$$\underline{35} \times 100 = 350 \quad \underline{45} \times 100 = 45$$

$$10, 100$$

$$\underline{405} \times 100 = 405 \quad \underline{2} \times 100 = 2$$

$$100, 100$$

$$\therefore \underline{\text{Descending order}} = 4.05, 3.5, 0.45, 0.02$$

### 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.

$$\begin{array}{r} 4.25 \\ +. 00 \\ \hline 4.25 \end{array} \quad \therefore 4.25 \approx 4$$

(ii) 29.67 to nearest tenths

$$\begin{array}{r} 29.67 \\ +. 10 \\ \hline 29.70 \end{array} \quad \therefore 29.67 \approx 29.7$$

(iii) 39.95 to nearest tenths

$$\begin{array}{r}
 39.98 \\
 + .10 \\
 \hline
 40.00
 \end{array}
 \quad \underline{\Omega} 40.0$$

Note: consider the answer upto the required place value

#### Ref

MK old edition pg 48

Understanding mtc pg 33-35

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### 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	I	V	X	L	C	D	M

$$\begin{array}{rcl}
 \text{(ii)} & 75 & = 70 + 5 \\
 & & LXX + V \\
 & & = LXXV
 \end{array}$$

$$\begin{array}{rcl}
 \text{(iii)} & 555 & = 500 + 50 + 5 \\
 & & D + L + V \\
 & & = DLV
 \end{array}$$

#### Activity

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

### 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				
			75				

$$\begin{array}{rcl}
 \text{(ii)} & CCCXCIX & \\
 & CCC & = 300 \\
 & XC & = 90 \\
 & IX & = 9 \\
 & \hline & 399
 \end{array}$$

$$\begin{array}{rcl}
 \text{(iii)} & CMLXIX & \\
 & CM & = 900 \\
 & LX & = 60 \\
 & IX & = 9 \\
 & \hline & 969
 \end{array}$$

#### Activity

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

### LESSON 16

Subtopic:	Operations on Roman Numerals						
Content:	(a) Addition						
	(b) Subtraction						
Examples:	(i) Work out and answer in Hindu Arabic						
	XL + XV						
	XL = 40						
	XV = + 15						
	<u>55</u>						

$$\begin{array}{rcl}
 \text{(ii)} & \text{Simplify in Roman system} & \\
 & LXXX - XX & \text{subtract } \therefore 60 = LX \\
 & LXXX = 80 & 80 \\
 & XX = 20 & - 20 \\
 & & 60
 \end{array}$$

$$\begin{array}{rcl}
 \text{(iii)} & \text{Peter had LIX goats and sold XIV goats} & \\
 & \text{How many goats remained (answer in Hindu Arabic)} & \\
 & LIX & 69 \\
 & XIV & - 14 \\
 & & 55 \text{ goats}
 \end{array}$$

#### 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  
(6) XX + III

(9) CM – CL  
(10) Word problems

**Remarks**  
Ref: Mk old edition pg 50-51

### LESSON 17

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

$$\begin{array}{c|cc|c} & 5 & 23 & \\ \hline & & 14 & 3 \\ \hline & & & \end{array}$$

$\therefore 23 = 43_{\text{five}}$

b) Converting from base ten to binary base

19_{\text{ten}}		
BW	BT	R
2	19	1
2	9	1
2	4	0
2	2	0
		1

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

**Remarks**

### LESSON 18

Subtopic: Changing to decimal / base ten  
Content:  
Examples: (a) express 412<sub>five</sub> to base ten

$$\begin{array}{r} 2 \ 1 \ 0 \\ 4 \ 1 \ 2_{\text{five}} \\ \hline \end{array} = (4 \times 5^2) + (1 \times 5^1) + (2 \times 5^0) \\ = (4 \times 5 \times 5) + (1 \times 5) + (2 \times 1)$$

$$\begin{aligned} &= 100 + 5 + 2 \\ &= 107_{\text{ten}} \end{aligned}$$

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

### Activity

Trs' collection

**Remarks**

### LESSON 19

Subtopic: Operations on bases  
Content: Addition of same non decimal base numerals  
Examples: (i)  $23_{\text{five}} + 21_{\text{five}}$

$$\begin{array}{r} 23_{\text{five}} \\ + 21_{\text{five}} \\ \hline 44_{\text{five}} \end{array}$$

(ii) Add:  $1101 + 11_{\text{two}}$

$$\begin{array}{r} 1101_{\text{two}} \\ + 11_{\text{two}} \\ \hline 10000_{\text{two}} \end{array}$$

### Activity

Trs' collection

**Remarks**

### LESSON 20

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

$$\begin{array}{r} 34_{\text{five}} \\ - 13_{\text{five}} \\ \hline 21_{\text{five}} \end{array}$$

(ii) Subtract  $1011_{\text{two}} - 111_{\text{two}}$   
 $1010_{\text{two}}$

**Activity**  
Trs' collection  
**Remarks**

### LESSON 21

Subtopic:

Multiplication in Binary system

Content:

- Multiply      (i)    2 by 2  
                      (ii)    3 by 2

                      (iii)    to 4 b 3 digit numerals

Examples:

(i)     $10_{\text{two}} \times 11_{\text{two}}$

$$\begin{array}{r} 10_{\text{two}} \\ \times 11_{\text{two}} \\ \hline 10 \\ + 100 \\ \hline 110_{\text{two}} \end{array}$$

(ii)     $11_{\text{two}} \times 11_{\text{two}}$

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

**Activity**  
Trs' collection  
**Remarks**

### LESSON 22

Subtopic:

Operations on finites

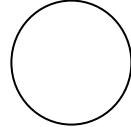
Content:

Addition in finite/modular system

Examples:

(i)    Add:  $3 + 4 = -$  (finite 5)

(a)



(b)

$$\begin{aligned} 3 + 4 &= - \text{ (finite 5)} \\ 3 + 4 &= 7 \\ 7 \div 5 &= 1 \text{ r } 2 \\ 3 + 4 &= 2 \text{ (finite 5)} \\ &= 2 \text{ (finite 5)} \end{aligned}$$

(ii)     $6 + 8 = y$  (finite 12)

**Activity**  
**Remarks**

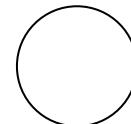
### LESSON 23

SUBTOPIC:

Multiplication in finite systems

Examples:

(i)    Work out  $3 \times 4 = x$  (finite 5)



$$\begin{aligned} 3 \times 4 &\text{ means} \\ 3 &\text{ groups of 4} \\ \therefore 3 \times 4 &= 2 \text{ (finite 5)} \\ \text{So } x &= 2 \text{ (finite 5)} \end{aligned}$$

(ii)     $3 \times 4 = x$  (finite 5)  
 $3 \times 4 = 12$   
 $12 \div 5 = 2 \text{ r } 2$   
 $3 \times 4 = 2 \text{ (finite 5)}$   
 $\therefore x = 2 \text{ (finite 5)}$

**Activity**  
Ref: MK old edition pg 245-253  
**Remarks**

### LESSON 24

Subtopic:

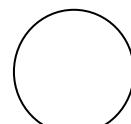
Subtraction in finite system.

Content:

- (a)    Using the dial  
(b)    By calculation method

Example:

(i)    Subtract  $3 - 4 = -$  (finite 5)



$$\therefore 3 - 4 = 4 \text{ (finite 5)}$$

(ii)     $3 - 4 = -$  (finite 5)  
 $(3 + 5) - 4$

$$\begin{array}{r} 8 - 4 \\ = 4 \end{array}$$

$\therefore 3 - 4 = 4$  (finite 5)

### Activity

Mk old edition pg 245-253

### Remarks

## LESSON 25

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)  
 $P = 7 \div 6 = 1 \text{ r } 1$   
 $P = 1$  (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)  
 $\frac{2x}{2} = \frac{12}{2}$   
 $X = 6$  (finite 5)

### Activity

Trs' collection

### Remarks

## LESSON 26

Subtopic:

Contents:

Examples:

Application of finites.

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

- (a) If today is a Friday, what day of the week will it be after 23 days.

$$\text{Day} + 23 = - \text{ (finite 7)}$$

$$5 + 23 = 28$$

$$28 \div 7 = 4 \text{ r } 0$$

0 (finite 7)

$\therefore$  The day will be Sunday.

- (b) If today is Friday, what day of the week was 45 days ago?

$$\text{Day} - 45 = \text{ (finite 7)}$$

$$5 - \frac{45}{7} = 6 \text{ r } 3$$

5 - 3 (finite 7)

2 finite 7

$\therefore$  It was Tuesday

- (c) It is April now, which month will it be after 18 months

$$\text{Month} - 18 = \text{ (finite 12)}$$

$$4 - \frac{18}{12} = 1 \text{ r } 6$$

4 - 6

(4 + 12) - 6

$$16 - 6 = 10 \text{ (finite 12)}$$

It will be October.

### Activity

MK old edition 252-253

### Remarks

## 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

4. (a) values                          (b) place values                          (c) Powers  
Write 7432 in standard/ scientific form
5. Express the following in single form  
 (a)  $5000 + 70 + 3$   
 (b)  $(7 \times 10000) + (8 \times 1000) + (3 \times 100) + (7 \times 10) + (2 \times 1)$   
 (c)  $(7 \times 10^3) + (4 \times 10^2) + (3 \times 10^1) + 5 \times 10^0$   
 (d)  $8.56 \times 10^2$
6. Write 2592028 in words  
Write: six million, eight hundred thousand, nine hundred sixteen
7. (a) Round off 4867 to the nearest tens  
 (b) Round off 79581 to the nearest hundreds.  
 (c) Round off 79581 to the nearest thousands.
8. Write the place value and value of the underlined digits  
 (a) 0.784                          (b) 3.782                          (c) 5.948
9. Write 0.328 in words  
Write Twenty seven and six tenths in figures.
10. Expand 5.78 using  
 (a) place values                          (b) values                          (c) exponents
11. Express 0.432 in standard form
12. Arrange 0.44, 0.4, 4.4 in ascending order.  
Arrange 0.35, 0.5, 0.7, 0.33 in descending order.
13. Round off 39.96 to the nearest tenth.  
Write 99 in Roman Numerals.
14. Write XLV in Hindu Arabic system.  
Work out: XI = IX
15. Change  $26_{\text{ten}}$  to base six .  
Write  $346_{\text{seven}}$  in words.
16. Give the place value of each digit in  $243_{\text{five}}$ .  
Expand  $462_{\text{seven}}$  using powers.
17. Change  $341_{\text{six}}$  to base ten  
Change  $124_{\text{five}}$  to base six.  
If  $17_x = 16_{\text{ten}}$  find value of  $x$
18. Add  $55_{\text{seven}} + 33_{\text{seven}} = \underline{\quad}$  seven.  
Subtract:  $44_{\text{five}} - 12_{\text{five}}$
19. Multiply  $10_{\text{two}} \times 11_{\text{two}}$   
Change 13 to finite 7.
20. Add:  $4 + 4 = \underline{\quad}$  finite 5  
Multiply:  $2 \times 4 = \underline{\quad}$  finite 5  
Subtract:  $2 - 4 = \underline{\quad}$  finite 6
21. Divide  $5 \div 3 = \underline{\quad}$  finite 7  
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 WHOLE 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	1
7	8	6	4	7	6	2	
+	1	9	7	9	8	6	8
<hr/>	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

### LESSON 2.

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

Examples: (a)

4	1	1	12	13			
✓	✓	✓	✓	1	8	6	
-	1	3	4	5	1	0	2
<hr/>	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 .

### LESSON 3

Subtopic:

Multiplication

Multiplication of large numbers

- By 2 digit number

- By 3 digit number

Examples:

(i) 
$$\begin{array}{r} 1 \ 4 \ 3 \\ \times 1 \ 8 \\ \hline 1 \ 1 \ 4 \ 4 \\ + 1 \ 4 \ 3 \ 0 \\ \hline 2 \ 5 \ 7 \ 4 \end{array}$$

0	0 <sup>1</sup>	0	3
0	1	4	
2	8	2	4
5	7	4	

$$143 \times 18 = 02574 \\ = 2574$$

Example: (b)

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

$$\begin{array}{r} 5 \ 4 \ 6 \ 0 \\ \times 8 \ 5 \ 0 \\ \hline 0 \ 0 \ 0 \ 0 \\ 2 \ 7 \ 3 \ 0 \ 0 \\ + 4 \ 3 \ 6 \ 8 \ 0 \\ \hline 4 \ 6 \ 4 \ 1 \ 0 \ 0 \ 0 \end{array}$$

5	4	6	0
4	0	2	0
2	2	3	0
5	0	0	0
6	0	0	0
4	0	0	0
1	0	0	0

$$= 4641000$$

### Activity

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

### Remarks

### LESSON 4

Subtopic:

Division

Content: Divide large numbers.

- By 2 digit

- By 3 digit

Examples:

(i) 152

$$\begin{array}{r} 13 \overline{) 1976} \\ - 13 \\ \hline 67 \\ - 65 \\ \hline 26 \\ - 26 \\ \hline 00 \end{array}$$

(ii)

$$\begin{array}{r} 53 \\ 120 \overline{) 6360} \\ - 600 \\ \hline 360 \\ - 360 \\ \hline 000 \end{array}$$

### Activity

Mk new edition pg 37-38

Fountain pg 37-38

Understanding MTCpg 49-53

### Remarks

### 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?

$$\begin{array}{r} 50 \\ 440 \overline{) 220000} \\ - 2200 \\ \hline 0 \\ 880 \\ \hline 1320 \\ - 0 \\ \hline 0 \end{array}$$

### Activity

Mk new edition pg 37-38

Fountain pg 37-38

Understanding MTCpg 49-53

### LESSON 6

Subtopic:

Combined operations on numbers

Content:

Use of BO MAS

Examples:

(i) Work out:  $9 - 15 + 6$

$$\begin{array}{r} (9 + 6) - 15 \\ 15 - 15 \\ 0 \end{array}$$

(ii)  $8 \div 4 \times 3$

(iii)  $18 - (4 \times 3) \div 6$

### BODMAS

$$\begin{array}{r} (8 \div 4) \times 2 \\ 2 \times 2 \\ 4 \end{array}$$

- iv) Kawoya got 32 mangoes in the morning and ate 28 of them .  
 $\frac{1}{2}$  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

### LESSON 7

Subtopic: Properties of numbers.

Content: (i) Commutative properties

(ii) Distributive property

(iii) Associative property

#### Commutative

Order of addition or multiplication does not change the results

$$\begin{array}{ll} (a) & 3 + 4 = 4 + 3 \\ & 7 = 7 \end{array} \quad \begin{array}{ll} (b) & 4 \times 5 = 5 \times 4 \\ & 20 = 20 \end{array}$$

#### Associative property

Order of grouping two numbers in addition or multiplication does not change results

$$\begin{array}{lll} \text{e.g. } & 3 + (8 + 9) & = (3 + 8) + 9 \\ & 3 + 17 & = 11 + 9 \\ & 20 & = 20 \end{array}$$

#### Distribution property

e.g Work out using distributive property  
 $(2 \times 3) + (2 \times 4)$   
 $2(3 + 4)$

$$\begin{array}{r} 2(7) \\ 2 \times 7 = 14 \end{array}$$

#### Activity

Trs' collection

#### Remarks

### REVISION WEEK ON OPERATIONS ON NUMBERS

1. Add:  $\begin{array}{r} 8975631 \\ + 2867542 \\ \hline \end{array}$

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:  $\begin{array}{r} 6432278 \\ - 2321101 \\ \hline \end{array}$

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  $5984 \div 68$

11. A farmer has sh 688640 to pay to 32 workers. How much money does each worker get?

12. Work out  $18 - (3 \times 2) \div 6$

## 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 is a multiple of 3.  
E. g. 612  
$$\begin{aligned} & 6 + 1 + 2 \\ & 9 \div 3 = 3 \\ \therefore & 612 \text{ is divisible by } 3 \end{aligned}$$

(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  
 $\therefore 6248 \text{ is divisible by } 8$

### Activity

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

### Remarks

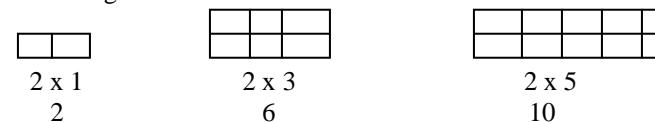
### LESSON 2

- 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.  
$$\begin{array}{ccc} 0 \rightarrow 1 & 0 \rightarrow 3 & 0 \\ & 0 \quad 0 & 0 \quad 0 \\ 1 + 2 = 3 & & 0 \quad 0 \quad 0 \\ & & 1 + 2 + 3 = 6 \end{array}$$

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

(iii) Rectangular numbers



(iv) Square numbers

e.g. 
$$\begin{array}{cccccc} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \\ 1 \times 1 = 1 & 2 \times 2 = 4 & 3 \times 3 = 9 & 4 \times 4 = 16 & & \end{array}$$

### Activity

- Fountain pg 43-48  
MK new edition pg 37  
Understanding pg 62-65

### Remarks

### LESSON 3

- Subtopic: Prime and composite numbers.  
Content:
  - List prime numbers
  - Composite numbers

Examples: (i) What is the sum of the 3<sup>rd</sup> and the 7<sup>th</sup> prime numbers  
Prime numbers are:

2, 3 <sup>3<sup>rd</sup></sup>, 5, 7, 11, 13, 17 <sup>7<sup>th</sup></sup>, 19, 23

$$\text{Sum} = 5 + 17 \\ = 22$$

- (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.

#### 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 1<sup>st</sup> number be n.

$$2^{\text{nd}} \text{ number} = n + 1$$

$$3^{\text{rd}} \text{ number} = n + 2$$

$$\text{But: } n + n + 1 + n + 2 = 36$$

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

$$3n + 3 = 36$$

$$3n + 3 - 3 = 36 - 3$$

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

$$n = 11$$

$$\begin{array}{l} 1^{\text{st}} \text{ number} = n \\ \text{and } n = 11 \end{array}$$

$$\begin{array}{l} 2^{\text{nd}} \text{ number} (n + 1) \\ 11 + 1 = 12 \end{array}$$

$$\begin{array}{l} 3^{\text{rd}} \text{ number is} \\ (n + 2) \\ 11 + 2 \\ 13 \end{array}$$

#### 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 1<sup>st</sup> number by (x)

2<sup>nd</sup> number be (x + 2)

3<sup>rd</sup> number be (x + 4)

$$\begin{array}{rcl} x + x + 2 + x + 4 & = & 24 \\ x + x + x + 2 + 4 & = & 24 \\ 3x + 6 & = & 24 \\ 3x + 6 - 6 & = & 24 - 6 \\ \underline{3x} & = & \underline{18} \\ 3 & & 3 \\ x & = & 6 \end{array}$$

These EVEN Numbers are:

$$\begin{array}{lll} 1^{\text{st}} \text{ is } 6, & 2^{\text{nd}} \text{ is } , & 3^{\text{rd}} \\ X + 2 & x + 4 & \\ 6 + 2 & 6 + 4 & \\ \hline 8 & 10 & \end{array}$$

#### 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?

$$F_{18} = \{1, 2, 3, 6, 9, 18\}$$

∴ 18 has 6 factors

(ii) Work out the sum of all the F<sub>20</sub>  
 $F_{20} = \{1, 2, 4, 5, 10, 20\}$   
 $\text{Sum} = 1 + 2 + 4 + 5 + 10 + 20$   
 $= 42$

(iii) Work out the GCF of 12 and 18  
 $F_{12} = \{1, 2, 3, 4, 6, 12\}$   
 $F_{18} = \{1, 2, 3, 6, 9, 18\}$   
 $CF = \{1, 2, 3, \cancel{6}\}$   
 $GCF = 6$

N.B (iv) The LCF is always 1

### Activity

Mk old edition pg 81

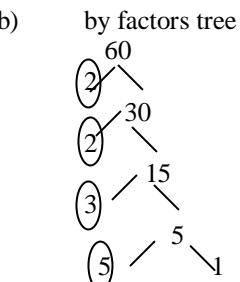
### Remarks

**LESSON 7**  
Subtopic: Prime factorization  
Content:  
- Using (a) Multiplication  
(b) Subscript method  
(c) Powers/ exponents

- Find number prime factorised.

(i) Find the prime factors of 60.  
(a) By ladder

$$\begin{array}{r} 60 \\ \hline 2 \quad | \quad 30 \\ \hline 2 \quad | \quad 15 \\ \hline 3 \quad | \quad 5 \\ \hline \quad | \quad 1 \end{array}$$



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

### 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 of 30 is  $2 \times y \times 5$ , 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

$$\begin{array}{rcl} 2 \times 3 \times y & = & 30 \\ 6y & = & 30 \\ \hline 6 & & 6 \\ y & = & 5 \end{array}$$

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

$$\begin{array}{r} 2 \mid 144 \\ \hline 2 \mid 72 \\ \hline 3 \mid 36 \\ \hline 2 \mid 18 \\ \hline 3 \mid 9 \\ \hline 3 \mid 3 \\ \hline \quad | \quad 1 \end{array}$$

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

$\therefore a = 2 \text{ and } b = 3$

(iii) Given that  $2^{2x} \times 2 = 32$  find the value of x.  
(1<sup>st</sup> prime factorise 32)  
i.e.  $2^{2x} \times 2^1 = 2^5$

$$\begin{array}{rcl} 2x+1 & = & 5 \\ 2x+1-1 & = & 5-1 \\ 2x & = & 4 \\ \hline 2 & & 2 \end{array}$$

$2^{2x} = 2^4$

$2^{2x} = 2^4$

$2^{2x} = 2^4$

$$X = 2_2$$

### Activity

Mk old edition pg 83

### Remarks

### 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.  
 $M_4 = \{4, 8, 12, 16, 20, 24, 28, \dots\}$   
 M<sub>4</sub> 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.

	24	36
2	12	18
2	6	9
3	3	9
3	1	1
	1	1

$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 3 = 72$

### Activity

Mk old edition pg 86 .

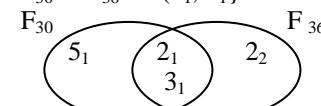
### Remarks

### LESSON 10

- Subtopic: Finding LCM and GCF by prime factorization using a venn diagram  
 Content: - Representing prime factors on the venn diagrams.

- Examples: (i) Find the GCF/HCF and LCM from the venn diagram  
 (ii) Work out the prime factors of 30 and 36
- 
- $F_{30} = \{2_1, 3_1, 5_1\}$
- $F_{36} = \{2_1, 2_2, 3_1, 3_2\}$
- (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

$$\text{GCF} = F_{30} \cap F_{36} = \{2_1, 3_1\} \\ = 2 \times 3 = 6$$

(b) LCM of 30 and 36

$$\text{LCM} = F_{30} \cup F_{36} = \{2_1, 2_2, 3_1, 3_2, 5_1\} \\ = 2 \times 2 \times 3 \times 3 \times 5 = 180$$

### Activity

Mk old edition pg 86-87

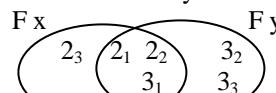
### Remarks

### 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  
 $\{21, 22, 31, 32, 33\}$   
 $y = 2 \times 2 \times 3 \times 3 \times 3$   
 $\underline{y = 108}$

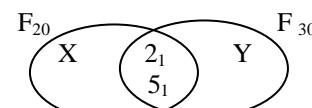
Factors of x = {21, 22, 31, 23}

$$2 \times 2 \times 3 \times 2 \\ X = 24$$

$$\text{GCF} = F_x \cap F_y = \{2_1, 2_2, 3_1\} \\ = 2 \times 2 \times 3 \\ \underline{\text{GCF} = 12}$$

$$\text{LCM} = F_x \cup F_y \\ = 2_1, 2_2, 2_3, 3_1, 3_2, 3_3, \\ 2 \times 2 \times 2 \times 3 \times 3 \times 3 \\ \underline{\text{LCM} = 216}$$

(ii) Find the unknowns



$$\begin{array}{lll} F_{20} = \{x, 21, 51\} & F_{30} = \{21, 51, y\} & \text{GCF of } 20 \text{ and } 30 \\ 20 = x + 2 \times 5 & 30 = 2 \times 5 \times y & \text{GCF} = F_{20} \cap F_{30} \\ \frac{20}{10} = \frac{10x}{10} & \frac{30}{10} = \frac{10y}{10} & \text{GCF} = \{21, 51\} \\ 2 = x & 3 = y & = 2 \times 5 \\ \therefore x = 2_2 & \therefore y = 3_1 & \therefore \text{GCF} = 10 \end{array}$$

$$\begin{aligned} \text{LCM} &= F_{20} \cup F_{30} \\ &= \{21, 22, 31, 51\} \\ &= 2 \times 2 \times 3 \times 5 \\ \therefore \text{LCM} &= 60 \end{aligned}$$

### Activity

Mk old edition pg 88-89

### Remarks

### 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 2<sup>nd</sup> No be y  

$$\begin{array}{rcl} 1^{\text{st}} \text{ No} \times 2^{\text{nd}} \text{ No} & = & \text{LCM} \times \text{GCF} \\ 48 \times y & = & 144 \times 12 \\ 48 & & 48 \\ y & = & 36 \end{array}$$

- (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

$$2 \times 2 \times 3 = 12$$

$$\text{largest divisor} = 12$$

### Activity

Oxford primary MTC BK 6 pgs 34 – 41

### Remarks

### 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

$$\begin{aligned} \text{LCM} &= 2 \times 2 \times 3 \times 3 = 36 \\ \therefore \text{Number is LCM} + \text{RCM} &= 36 + 1 = 37 \end{aligned}$$

- (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

$$M_{40} = \{40, 80, 120, 160, \dots\}$$

$$M_{60} = \{60, 120, 180, \dots\}$$

$$\text{LCM} = 120$$

The width is 120 cm

### Activity

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

### Remarks

### LESSON 14

Subtopic:

Working with powers of whole numbers.

Content:

- Find a number from powers

Example:

- Express number as product of powers of a given numbers

Operation on powers.

- (i) What is  $7^3$ .

$$7^3 = 7 \times 7 \times 7 = 343$$

- (ii) Express 64 using powers of fours

4	64
4	16

$$\begin{array}{r} 4 \quad 4 \\ \hline 1 \end{array}$$

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

$$64 = 4^3$$

(iii) Work out:  $23 + 32 + 50$   
 $(2 \times 2 \times 2) + (3 \times 3) + 1$   
 $8 \quad + \quad 9 \quad + 1$   
 $= 18$

### Activity

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

### Remarks

### LESSON 15

Subtopic: Squares of numbers

Content: - Squares of

- (a) whole numbers
- (b) fractions
- (c) mixed fractions
- (d) decimal

Example: (i) What is the square of 12?  
 $12^2 = 12 \times 12 = 144$

(ii) Work out the square of  $\frac{3}{4}$

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

(iii) Calculate the square of  $1\frac{1}{2}$

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

(iv) Find  $(0.15)^2$

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

(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

### LESSON 16

Subtopic: Square roots.

Content: Square roots of whole numbers.

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

$$\begin{array}{r} 2 \mid 36 \\ 2 \mid 18 \\ 3 \mid 9 \\ 3 \mid 3 \\ \hline & 1 \end{array} \quad \therefore \sqrt{36} = \frac{\sqrt{x \times 2 \times 2 \times 3 \times 3}}{\sqrt{(2 \times 2) \times (3 \times 3)}} = \frac{2 \times 3}{6}$$

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

$$\begin{array}{r} 2 \mid 324 \\ 2 \mid 162 \\ 3 \mid 81 \\ 3 \mid 27 \\ 3 \mid 9 \\ 3 \mid 3 \\ \hline & 1 \end{array} \quad \sqrt{324} = 2 \times 3 \times 3$$

$$\therefore \sqrt{324} = 18$$

### Activity

A New MK pupils' MTC BK 6 pg 38.

### Remarks

### 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  $\sqrt{6\frac{1}{4}}$

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

(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

### 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  $3\frac{1}{2}$  m. What out its area.

$$\text{Area of sq} = S \times S$$

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

$$\therefore \text{Area} = 12\frac{1}{4} \text{m}^2.$$

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

- (a) Calculate its side

$$\begin{aligned} \text{Area} &= \text{side} \times \text{side} & 24 &= \text{side} \\ 576 &= S \times S \\ \sqrt{576} &= \sqrt{S^2} & \therefore \text{side} &= 24 \end{aligned}$$

$$\begin{array}{r} 2 | 576 \\ 2 | 288 \\ 2 | 144 \\ 2 | 72 \\ 2 | 36 \\ 2 | 18 \\ 2 | 9 \\ 3 | 3 \\ \hline & 1 \end{array}$$

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

- (b) Find the perimeter of the square.

$$P = 4 \times \text{side}$$

$$4 \times 24$$

$$\therefore P = 96$$

### 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

### 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:

$$\begin{aligned} \text{Vol of cube} &= S \times S \times S \\ V &= 6 \text{cm} \times 6 \text{cm} \times 6 \text{cm} \\ V &= 216 \text{cm}^3 \end{aligned}$$

(iii) Work out the cube root of

$$\begin{array}{r} 64 = 2 | 64 \\ 2 | 32 \\ 2 | 16 \\ 2 | 8 \\ 2 | 4 \\ 2 | 2 \\ \hline & 1 \end{array}$$

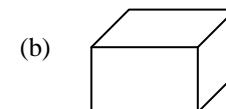
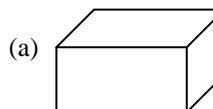
$$\begin{aligned} \sqrt[3]{64} &= \sqrt[3]{(2 \times 2 \times 2) \times (2 \times 2 \times 2)} \\ &= 2 \times 2 \\ &= 4 \end{aligned}$$

### Activity

The Pupils will do exercise below

1. Work out  $2^3$

2. Find the number of cubes in the figure:



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

### LESSON 20

Subtopic: Number patterns and sequences

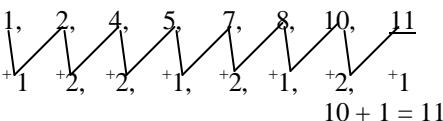
Content: Complete series and sequences

Examples: Find the missing number:

(a) 2, 3, 5, 7, \_\_\_\_

11 is the next number  
(prime numbers)

(b) 4, 9, 16, 25, \_\_\_\_  
 $2 \times 2$     $3 \times 3$     $4 \times 4$     $5 \times 5$     $6 \times 6$   
(square numbers)

(c) 

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

$18 - 6 = 12$

(e)  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ , \_\_\_\_

### Activity

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

Fountain pg 49

### Remarks

## 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)  $x = 15 - (9 + 5)$     $Y = 15 - (3 + 5)$     $W = 15 - (8 + 3)$   
 $X = 15 - 14$     $Y = 15 - 8$     $W = 15 - 11$   
 $X = 1$     $Y = 7$     $W = 4$

N.B Vary the squares to 16 squares.

### Activity

DIVINE EDUCATION CENTRE:0784540287/0751565742

Work on magic squares from Understanding MTC BKs 5 and 6  
Understanding mtc pg 74

### Remarks:

## 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 denominations  
(ii) Addition of mixed numbers

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

$$\begin{aligned}\frac{2 \times 4}{3 \times 4} + \frac{1 \times 3}{4 \times 3} \\ \frac{8}{12} + \frac{3}{12} \\ \underline{\underline{\frac{11}{12}}}\end{aligned}$$

(ii) Find the sum of  $2\frac{2}{3}$  and  $2\frac{1}{4}$

**Solution:**

$$\begin{aligned}2\frac{2}{3} + 2\frac{1}{4} &= (2 + 2) + \frac{2}{3} + \frac{1}{4} \text{ LCM } 12 \\ 4 + \left[ \frac{2 \times 4}{3 \times 4} \right] + \left[ \frac{1 \times 3}{4 \times 3} \right] \\ 4 + \frac{8}{12} + \frac{3}{12} \\ 4 + \frac{11}{12} \\ 4\frac{11}{12}\end{aligned}$$

### Activity

- Fountain pg 56-57

- Understanding pg 85

## LESSON 2

Sub-topic: Operation on fractions

Content: (i) Subtraction of simple fractions with different denominations

Examples: (ii) Subtraction of mixed numbers  
(a) Subtract:  $\frac{3}{4} - \frac{3}{5}$  LCM = 20

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

(b) Subtraction:  $4\frac{1}{3} - 1\frac{7}{8}$   
 $\frac{13}{3} - \frac{15}{8} = \frac{104 - 45}{24}$   
 $= \frac{59}{24}$

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

$$\frac{1}{3} - \frac{7}{8} = (4 - 1) + (\frac{1}{3} - \frac{7}{8})$$

$$= 3\frac{1}{3} - 1\frac{7}{8}$$

$$= \frac{80 - 21}{24}$$

$$= \frac{59}{24} = 2\frac{11}{24}$$

### Activity

Understanding mtc pg 87

Fountain pg 58-60

### Remarks

## LESSON 3

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

Content:

-

Examples

(a)

Addition of fractions involving word problems  
subtraction of fractions involving word problems  
A man used three quarters of his shamba to grow groundnuts, a half to grow potatoes and two thirds to grow water melons. Find total fraction of the whole land used.

Solutions

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

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

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

$$\begin{aligned} \frac{23}{12} &= \frac{12}{12} + \frac{11}{12} \\ &= 2\frac{11}{12} \end{aligned}$$

(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?

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

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

### Activity

Trs' collection

### Remarks

## LESSON 4

Sub-topic:

Content: Addition and subtraction by use of BODMAS

Addition

Multiplication

Division

Of

Brackets

Example:

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

Solution

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

Rearrange

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

$$\frac{(15+6)-20}{30} = \frac{21-20}{30}$$

$$\frac{1}{30}$$

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

Solution

$$1\frac{1}{3} + \frac{3}{4} - \frac{5}{6} \quad (\text{Use BODMAS})$$

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

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

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

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

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

Activity

Fountain bk 6 pg 59 .

Remarks

## LESSON 5

Sub-topic: Multiplication of fractions

Content: - Multiplication of fractions

Examples:

- Multiplication of simple fractions

Fraction with whole number.

(i)  $\frac{1}{3} \times 12 = \frac{1}{3} \times \frac{12}{1}$  | calculate  $\frac{3}{4}$  of 12

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

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

$$= 9$$

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

(b) Fraction by fractions

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

$$\frac{2 \times 3}{5 \times 4} = \frac{6}{20} \cancel{3}^1$$

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

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

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

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

## Activity

Fountain pg 60-61

Understanding mtc pg 79-81

New Mk pg 46-47

Remarks

## 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  $\frac{3}{4}$ ?

Let the reciprocal of  $\frac{3}{4}$  be t.

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

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

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

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

∴ Reciprocal of  $\frac{3}{4}$  is  $\frac{4}{3}$

What is the reciprocal of  $2\frac{1}{4}$ ?

Let the reciprocal of  $2\frac{1}{4}$  be y.

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

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

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

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

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

∴ Reciprocal of  $2\frac{1}{4}$  is  $\frac{4}{9}$

$$\begin{aligned} 1 \div 2\frac{1}{4} &= 1 \div \frac{9}{4} \\ &= 1 \times \frac{4}{9} \\ &= \frac{4}{9} \end{aligned}$$

### Activity

Old edition MK pg 48

### Remarks

## LESSON 6

Sub-topic: division of fractions

Content: - Divide fractions using reciprocals

- Divide fractions using LCM

Examples:

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

$$\frac{2}{3} \div \frac{1}{2} \quad \text{Reciprocal of } \frac{2}{3} \text{ is } \frac{1}{2}$$
$$\frac{2}{3} \times \frac{1}{2} = \frac{2}{6}^1 = \frac{1}{3}$$

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

$$\frac{2}{3} \div \frac{2}{1} \quad \text{LCM} = 3$$
$$\frac{1}{3} \times \frac{2}{1} \div \frac{2}{1} \times 3$$

$$2 \div 6.$$

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

### Activity

New MK BK 6.

### Remarks

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

LCM

$$3 \div 1 \quad \text{LCM } 4$$

$$4 \quad 2$$

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

$$3 \div 2$$

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

Reciprocal

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

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

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

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

(b) Divide  $2\frac{1}{2} \div 1\frac{1}{4}$

LCM

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

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

$$\frac{2}{2} \times \frac{5}{5} \div \frac{5}{4} \times \frac{1}{1}$$

$$(2 \times 5) \div 5$$

$$10 \div 5 = 2$$

Reciprocal

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

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

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

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

### Activity

New MK pg 50  
Fountain pg 62-64 .

### Remarks

### 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:  $\frac{5}{6} - \frac{3}{4} \div 1 \frac{1}{2}$

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

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

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

$$\begin{array}{r} \frac{10}{12} - \frac{6}{12} = \frac{4}{12} \\ = \frac{1}{3} \end{array}$$

### Activity

Fountain pg 64-66

New mk pg 51

Old mk pg 113

### Remarks:

Emphasis should be on the order of BODMAS

### 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)  $7.04 + 1.6$  (iii) Add  $2.4 + 0.254$

$$\begin{array}{r} 1.5 \\ + 0.4 \\ \hline 1.9 \end{array} \quad \begin{array}{r} 7.04 \\ + 1.6 \\ \hline 8.64 \end{array} \quad \begin{array}{r} 2.4 \\ + 0.254 \\ \hline 2.654 \end{array}$$

#### (b)

(i) Add;  $1.5 + 1.6$  (ii) Add  $0.09 + 0.18$  (iii) Add  $0.067 + 0.057$

$$\begin{array}{r} 1 \\ 1.5 \\ + 1.6 \\ \hline 3.1 \end{array} \quad \begin{array}{r} 1 \\ 0.09 \\ + 0.08 \\ \hline 0.27 \end{array} \quad \begin{array}{r} 11 \\ 0.067 \\ + 0.057 \\ \hline 0.124 \end{array}$$

#### 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  $2.085 - 0.03$

$$\begin{array}{r} 2.5 \\ - 1.3 \\ \hline 1.2 \end{array} \quad \begin{array}{r} 0.98 \\ - 0.4 \\ \hline 0.58 \end{array} \quad \begin{array}{r} 2.085 \\ - 0.03 \\ \hline 2.602 \end{array}$$

#### Example (b)

(i) Subtract  $2.8 - 0.9$

$$\begin{array}{r}
 1 \\
 2.18 \\
 - 0.9 \\
 \hline
 1.9
 \end{array}$$

(ii) Subtract  $1.45 - 0.6$

$$\begin{array}{r}
 0 \\
 4.45 \\
 - 0.6 \\
 \hline
 0.85
 \end{array}$$

(iii) Subtract  $2.7 - 0.098$

$$\begin{array}{r}
 6\ 9 \\
 2.7\ 10\ 10 \\
 - 0.0\ 9\ 8 \\
 \hline
 2.6\ 0\ 2
 \end{array}$$

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

## LESSON 9

Subtopic: Decimals  
Content: Addition and subtraction of decimals (consolidated)

(a)  $8 - 5.16 + 2.13$

$$\begin{array}{r}
 8.00 \\
 + 2.13 \\
 \hline
 10.13
 \end{array}
 \quad
 \begin{array}{r}
 9\ 10 \\
 40.413 = 4.97 \\
 - 5.16 \\
 \hline
 4.97
 \end{array}$$

(b)  $7 . (0.45 + 1.71)$

$$\begin{array}{r}
 1.71 \\
 + 0.45 \\
 \hline
 2.16
 \end{array}
 \quad
 \begin{array}{r}
 6\ 9 \\
 7.10\ 10 \\
 - 2.16 \\
 \hline
 4.84
 \end{array}$$

(c)  $(1.306 - 1.1) + 1.067$

$$\begin{array}{r}
 1.306 \\
 - 1.1 \\
 \hline
 0.206
 \end{array}
 \quad
 \begin{array}{r}
 0.206 \\
 + 1.067 \\
 \hline
 1.273
 \end{array}$$

(c)  $3.64 + 5 - 2.42$

$$\begin{array}{r}
 3.64 \\
 + 5.00 \\
 \hline
 8.64
 \end{array}
 \quad
 \begin{array}{r}
 8.64 \\
 - 2.42 \\
 \hline
 6.22
 \end{array}$$

$$\begin{array}{r}
 8.64 \\
 \hline
 6.22
 \end{array}$$

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?

$$\begin{array}{r}
 4 \\
 4.510 \\
 - 0.35 \\
 \hline
 4.15
 \end{array}$$

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?

$$\begin{array}{r}
 1^{\text{st}} \text{ round} \quad 7.5 \\
 2^{\text{nd}} \text{ round} \quad + 3.8 \\
 \hline
 11.3
 \end{array}$$

He scored 11.3 points altogether.

## Activity

Old edition Mk pg 115-116  
Fountain pg 71

## Remarks

## 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:  $0.9 \times 0.5$

**Method I**

$$\begin{array}{r}
 0.9 \leftarrow 1 \text{ dp} \\
 \times 0.5 \leftarrow 1 \text{ dp} \\
 \hline
 45 \\
 + 00 \\
 \hline
 0.45 \leftarrow 2 \text{ dp}
 \end{array}$$

**Method 2**

$$\begin{array}{r}
 9 \times 5 \\
 10 \quad 10 \\
 \hline
 = \frac{45}{100} \\
 = 0.45
 \end{array}$$

(a) (ii) Multiply  $1.32 \times 2.4$

**Method 1**

$$\begin{array}{r} 1.32 \\ \times 2.4 \\ \hline 528 \\ +264 \\ \hline 3.168 \end{array}$$

← 2 dp      ← 1 dp      ← 3 dp

(b) Multiply:  $1.4 \times 25$

**Method 1**

$$\begin{array}{r} 25 \\ \times 1.4 \\ \hline 100 \\ +25 \\ \hline 35.0 \end{array}$$

← 1 dp      ← 1 dp      ← 1 dp

**Method 2**

$$\begin{array}{r} 132 \\ 100 \\ \times 24 \\ \hline = \frac{3168}{1000} \\ \equiv 3.168 \end{array}$$

**Method 2**

$$\begin{array}{r} 14 \\ 10 \\ \times 25 \\ \hline = \frac{350}{10} \\ \equiv 35 \end{array}$$

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

**Method 1**

$$\begin{array}{r} 2.4 \\ 0.03 \\ \times 100 \\ \hline = \frac{240}{3} \\ \equiv 80 \end{array}$$

(d) Divide:  $0.072 \div 0.8$

**Method 1**

$$\begin{array}{r} 0.072 \\ 0.8 \\ \times 1000 \\ \hline = \frac{72}{800} \\ \equiv 0.09 \end{array}$$

$$= \frac{2^1}{800} = \frac{1}{400}$$

**Method 2**

$$\begin{array}{r} 24 \\ 10 \\ \div 3 \\ \hline = \frac{8}{10} \\ \equiv 80 \end{array}$$

**Method 2**

$$\begin{array}{r} 72 \\ 100 \\ \div 8 \\ \hline = \frac{9}{80} \\ \equiv 0.09 \end{array}$$

### Activity

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

### Remarks

### LESSON 11

Subtopic: Decimals  
Content: Division by decimals  
Division by whole numbers

### Example:

(a) Divide  $8 \div 0.02$

**Method 1**

$$\begin{array}{r} 8 \\ 0.02 \\ \times 100 \\ \hline = \frac{800}{2} \\ \equiv 400 \end{array}$$

**Method 2**

$$\begin{array}{r} 8 \\ \div \frac{2}{100} \\ \hline = \frac{8}{1} \times \frac{100}{2} \\ \equiv 400 \end{array}$$

(b) Divide:  $0.02 \div 8$

**Method 1**

$$\begin{array}{r} 0.02 \\ 8 \\ \times 100 \\ \hline = \frac{2^1}{800} \\ \equiv \frac{1}{400} \end{array}$$

**Method 2**

$$\begin{array}{r} 2 \\ 100 \\ \div 8 \\ \hline = \frac{2}{100} \times \frac{1}{8} \end{array}$$

### 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**

$$\frac{0.7 \times 0.6}{0.3} \times \frac{100}{100}$$

$$\begin{array}{r} \frac{42}{30} \\ \times 10 \\ \hline = \frac{14}{10} \\ \equiv 1.4 \end{array}$$

**Method 2**

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

$$\begin{array}{r} \frac{7}{10} \times \frac{6^2}{10} \times \frac{10}{3} \\ = \frac{14}{10} \\ \equiv 1.4 \end{array}$$

2. Work out:  $35 \times 0.5$

**Method 1**

$$\frac{35 \times 0.5}{0.05} \times \frac{100}{100}$$

$$\begin{array}{r} 35 \\ \times 5 \\ \hline 350 \end{array}$$

**Method 2**

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

$$\begin{array}{r} 35 \\ \times 5 \\ \hline 1 \\ 10 \\ \hline 350 \end{array}$$

Weight of one packet

$$= 5.5 \div 0.25$$

$$\text{Either } \frac{5.5 \times 100}{0.25 \times 100} = \frac{550}{25} = 22$$

There are 22 packets

$$\text{OR } \frac{55}{10} \div \frac{25}{100}$$

$$\begin{array}{r} 55 \\ \times 100 \\ \hline 10 \\ 255 \end{array}$$

22 packets

**Activity**

Old MK pg 121

Fountain pg 64-65

Understanding pg 73

**Remarks**

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**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**

$$\text{Perimeter of square} = 4S \\ = 4 \times 8.75$$

8.75

X 4

35.00

The perimeter is 35 cm

**Method 2**

$$P = 4S \\ = 4 \times \frac{875}{100} \\ = \frac{3500}{100}$$

= 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

**Activity**

New Mk pg 65

Old MK pg 118

Understanding mtc pg 98

**Remarks**

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## TERM II

### TOPICAL BREAKDOWN FOR TERM II

Theme	Topic	Sub topic		

Numeracy	Fractions	<ul style="list-style-type: none"> <li>• Multiplication of fractions by fractions</li> <li>• Division of fractions</li> <li>• Mixed operation on fraction</li> <li>• Operation on decimals (<math>x, +, -, \div</math>)</li> <li>• Mixed operation on decimals</li> <li>• Application of fractions</li> <li>• Ratios and proportion</li> <li>- Changing the fractions to ratios and ratios to fractions</li> <li>- Increasing in ratios</li> <li>- Finding the ratio of increase</li> <li>- Decrease quantity in ratios</li> <li>- Finding the ratio of increase</li> <li>- Sharing in ratios</li> <li>• Proportions</li> <li>- Consistent</li> <li>- Direct/simple proportionality</li> <li>- Indirect/inverse proportionality</li> <li>• Percentages</li> <li>- Changing fraction in percentages</li> <li>- Changing ratios to percentages and vice versa</li> <li>- Increasing and decreasing in percentages</li> <li>- Finding the percentages increase and decrease</li> <li>• Loss and profit</li> <li>• Percentage loss and profit</li> <li>• Simple interest</li> <li>• Solving word problems involving simple interest</li> <li>•</li> </ul>								
Interpretation of groups and data	Data handling	<ul style="list-style-type: none"> <li>• Collection of data from different sources</li> <li>• Presentation of data;</li> <li>- Tables</li> <li>- Line graphs</li> </ul>								

**TOPIC : RATIO AND PROPORTION**

## LESSON 14

Subtopic: Ratios

Content: (i) Form ratios

Examples: Ratios are ways of comparing similar quantities.

4kg and 5 kg

$$\frac{\text{Mass first quantity}}{\text{Mass second quantity}} = \frac{4}{5}$$

Ration = 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 100 cm

= 200 cm

40 cm to 200 cm

$$\begin{array}{r} \text{Ration } \frac{40}{10} : \frac{200}{10} \\ \underline{4 : 20} \\ \underline{1 : 5} \end{array}$$

(c) Write 1 to 1 as a ratio

$\frac{3}{4}$

LCM = 12 of fractions

$$\frac{1}{3} \times \frac{12}{4} : \frac{1}{4} \times \frac{12}{3}$$

$\underline{4 : 3}$

ratio 4 : 3

(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

$\frac{12}{4}$  to  $\frac{20}{4}$

$\frac{12}{4} : \frac{20}{4}$

$\frac{3}{1} : \frac{5}{1}$

$\underline{3 : 5}$

NOTE: Ratios must be simplified to its lowest terms

### Activity

New MK pg 67

Fountain 77-78

### Remarks

## 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

$\frac{4}{4} : \frac{5}{5}$

John's share:  $\frac{4}{9} \times \frac{27}{1}$  sweets

$\underline{4 \times 3}$  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

$\frac{7}{7} : \frac{3}{3}$

Total ratio =  $7 + 3 = 10$

Man's share  $\frac{7}{10} \times 200$  kg

$\underline{140}$  kg

(ii)

How many kg did the wife get?

$\frac{3}{10} \times 200$  OR  $200 - 140$

$\underline{60}$

## Activity

New MK pg 66

## Remarks

## LESSON 15

Subtopic: Ratios

Content: (i) Expressing ratios as fractions

(ii) Expressing fractions as ratios

(iii) Expressing quantities as ratios

Examples: (a) Express  $1 : 2$  as a fraction

Solution

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

Ans

(b) Express  $1$  as a ratio

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

Ans

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?

$$\begin{aligned} \text{Total ratio} &= 1 + 2 + 3 \\ &= 6 \end{aligned}$$

Ratios by names: Amos : Andrew : Allan  
 Ratio      1      :      2      :      3

$$\begin{aligned} \text{Amos} &= \frac{1}{6} \times 30,000 \\ &= \underline{\text{Shs } 5000} \end{aligned}$$

$$\begin{aligned} \text{Andrew} &= \frac{2}{6} \times 30,000 \\ &= \underline{\text{Shs } 10000} \end{aligned}$$

$$\begin{aligned} \text{Allan} &= \frac{3}{6} \times 30,000 \\ &= \underline{\text{Shs } 15000} \end{aligned}$$

### Activity

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

### Remarks

### LESSON 17

Ratios

Finding numbers when ratios are given

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		

$$\begin{aligned} t &= 14 \\ \text{Total} &= 3t \\ &= 3 \times t \\ &= 3 \times 14 \\ &= 42 \end{aligned}$$

$\therefore$  There are 42 pupils in the class

**Activity**  
 Old MK pg 135

### LESSON 18

Subtopic: Ratios  
 Content: - Increasing in a given ratio  
 Examples: (a) Decreasing in a given ratio  
 The prize of an article is increased from shs 1200 in a ratio 3 : 2. Find the new prize.

$$\begin{aligned} \text{Solution.} \\ \frac{3}{2} \times 1200 &= 600 \\ &= \underline{\text{Shs } 1800} \end{aligned}$$

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

$$\begin{aligned} \frac{5}{8} \times 2500 &= 3145 \\ &= \underline{\text{Shs } 15625} \end{aligned}$$

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

### LESSON 19

Subtopic: Ratios  
 Content: - Finding the ratio of increase  
 Examples: (a) Finding the ratio of decrease  
 A man's salary was shs 10000. It has been increased to shs 12000 in what ratio has it increased?  

$$\begin{aligned} \text{New salary} &= \text{shs } 12000 \\ \text{Old salary} &= \text{shs } 10000 \\ &= 6 \\ \text{Increased ratio} &= \frac{12000}{10000} \\ &= 5 \\ &= \underline{6 : 5} \end{aligned}$$

(b) A bag had 40 sweets, 12 more sweets were added.  
 (i) How many sweets are in the bag now?  

$$40 + 12 = 52 \text{ sweets}$$

(ii) In what ratio have the sweets increased  
 Increase in ratio =  $\frac{\text{New No}}{\text{Old No}}$   
 $= \frac{52}{40} = \frac{13}{10}$

Ratio increase = 13: 10

Finding the ratio of decrease

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 =  $\frac{\text{New No}}{\text{Old No}}$   
 $= \frac{35}{40} = \frac{7}{8}$

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 =  $\frac{\text{New No}}{\text{Old No}}$   
 $= \frac{1000}{1200} = \frac{5}{6}$

Ratio of decrease 5 : 6

### Activity

Old MK pg 132

### Remarks

### LESSON 19

Subtopic:

Ratios

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  $\frac{10}{2} = 5$  oranges  
 3 part represents  $\frac{10}{2} \times 3 = 15$  oranges  
 $= 5$  oranges

### Activity

Old MK pg 135

### Remarks

### 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** New ratio : Old ratio  
 1 pen costs 200/=  
 $\therefore 5$  pens cost  $(200 \times 5)/=$   
 $= 1000/=$   
 1 part = 200  
 5 parts =  $(200 \times 5)/= 1000/=$

Example (b) 4 pens cost 2000/=. What is the cost of 7 pens?  
 4 pens cost 2000/=  
 $\therefore 500$   
 1 pen costs  $\frac{2000}{4} = 500$   
 $7$  pens cost  $500 \times 7 = 3500/=$   
 New : old 1 part =  $\frac{2000}{4} = 500$   
 $7 : 4$   
 $? : 2000$  7 parts =  $500 \times 7 = 3500/=$   
 $4$  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  
 $1/ = \text{can buy } \left( \frac{2}{1800} \right) \text{ kg}$   
 $\therefore 3600/ = \text{can buy } \frac{2}{1800} \times 3600^2 = 4 \text{ kg of sugar}$

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

- (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?

$$\begin{array}{ll} \text{MEN} & \text{DAYS} \\ 3 \text{ men take} & 6 \text{ days} \\ 1 \text{ man takes} & (6 \times 3) \text{ days} \\ 9 \text{ men take} & \frac{6^2 \times 3^1}{9^3} = 2 \text{ days} \end{array}$$


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

$$\begin{array}{ll} \text{DAYS} & \text{CHILDREN} \\ \text{In 8 days it requires} & 2 \text{ children} \\ \text{In 1 day it requires} & (2 \times 8) \text{ children} \\ \text{In 4 days it requires} & \left[ \frac{2 \times 8}{4} \right] = 4 \text{ children} \end{array}$$


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- (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?

$$\begin{array}{ll} \text{SPEED} & \text{TIME} \\ \text{At 80km/hr the car takes} & 3 \text{ hours} \\ \text{At 1km/hr the car takes} & (3 \times 80) \text{ hrs} \\ \therefore \text{At 120km/hr the car take} & \frac{3^1 \times 80^2}{120} = 2 \text{ hrs} \\ & 40-1 \end{array}$$


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#### Activity

Fountain pg 82-83  
New MK pg 71

#### Remarks

#### LESSON 22

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

- Examples: (i) Express as fractions

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

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

$$(c) 33 \frac{1}{3} \% = \left[ \frac{100}{3} \right] \% = \left[ \frac{100 \div 100}{3 \div 1} \right] = \left[ \frac{100}{300} \right] = \frac{1}{3}$$

- (ii) Fractions as percentages

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

$$(b) \frac{2}{3} = \left[ \frac{2}{3} \times 100 \right] \% = \frac{200}{3} \% = 66 \frac{2}{3} \%$$

#### Activity

New MK pg 72-74  
Understanding mtc pg 113

#### Remarks

#### LESSON 23

Subtopic: Decimals as percentages.  
Content: - Express decimals as percentages  
- Change percentages to decimal

- Examples: (i) Convert 0.6 to percentage

$$0.6 = \frac{6}{10}$$

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

- (ii) What is 2.8 as a percentage?

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

$$\left[ \quad \right] \quad \left[ \quad \right]$$

$$\frac{28}{10} \times 100 \% = \frac{28}{10} \times \frac{100}{1} \% = 28\%$$

(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

$$(a) 1 : 2$$

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

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

$$\therefore \frac{3}{8} \times 100 \% = \frac{300}{8} \% = 37\frac{4}{8}\% = 37\frac{1}{2}\%$$

(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

## 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

## LESSON 26

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.

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

$$\left( \frac{15}{40} \times 100 \right) \% = \frac{1500}{40} = 37\frac{1}{2}\%$$

$$(b) \text{not sold} = 40 - 15 = 25$$

$$\left( \frac{25}{40} \times 100 \right) \% = \frac{2500}{40} = 62\frac{1}{2}\%$$

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

$$\begin{aligned} 20 \% \text{ of } 2500 &= \frac{20}{100} \times 2500 \\ &= \frac{20 \times 25}{100} \\ &= \underline{\text{sh } 500} \end{aligned}$$

### Activity

New MK pg 77

Old MK pg 150

Understanding mtc pg 117

### Remarks

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## LESSON 27

Subtopic:

Content:

Examples:

Expressing a quantity as percentage of the other

Find one quantity as percentage of another given quantity

(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

$$\begin{aligned} \frac{1 \text{ kg}}{1000 \text{ g}} &= 500 \text{ g} \\ 1 \text{ kg} &= 1000 \text{ g} \end{aligned}$$

In percentage

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

### Activity

Understanding mtc pg 117

### Remarks

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## LESSON 28

Subtopic: Sharing quantities using percentage

Content: Examples: Share quantities using given percentages.

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

(b) How many are girls?  
No of girls =  $(400 - 120)$   
= 280

### Activity

Old MK pg 151

### Remarks

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## LESSON 29

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

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

$$10X = 400$$

$$100 = 10$$

$$10x = 40$$

$$X = 400$$

(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

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

$$100 = 20$$

$$2y = 35$$

method II

If 20% of the number = 35

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

$$100 \% \text{ of the number} = 15$$

$$\begin{aligned} 10 \\ \underline{2y} \times 10 = 35 \times 10 \\ 2 \\ \underline{2y} = \underline{350} \\ 2 \\ \underline{Y} = 175 \text{ pupils} \end{aligned}$$

$$\begin{aligned} \frac{35}{2} \times 100 &= 35 \times 5 \\ 20 \\ 35 \times 100 &= 35 \times 5 \\ 20 \\ \underline{\text{The number}} &= 175 \end{aligned}$$

### 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

$$\begin{aligned} 105\% \text{ of } 800 &= \frac{105}{100} \times 800 \\ &= 840 \end{aligned}$$

(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

$$= 115 \times 400$$

$$= \frac{100}{100}$$

$$= 115 \times 4$$

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%

$$\begin{aligned} (100 - 10)\% \text{ of original value} \\ 90\% \text{ of } 900 &= \frac{90}{100} \times 900 = 810 \text{ litres} \end{aligned}$$

- (ii) Byansi had 180 cows. He sold 15% of them. How many cows remained  
 $(100 - 15)\% = 85\%$   
 $85\% \text{ of } 180 \text{ cows} = \frac{85}{100} \times 180 = 153 \text{ cow}$   
 $\therefore 153 \text{ cows remained}$

- (iii) A man's salary is \$ 800. How much will his salary be if it is cut by  $12 \frac{1}{2}\%$ ?  
 $(100 - 15)\% = 85\%$   
 Method  
 $87 \frac{1}{2}\% \text{ of } 800 = \left( \frac{175}{100} \times \frac{1}{100} \right) \times 800$   
 $\frac{175}{200} \times \frac{800}{2} = \frac{1400}{2} = 700$   
 $\underline{\underline{=\$ 700}}$

### Activity

Ne Mk pg 80

Old MK pg 133-136

Fountain pg 85

### 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

$$(2000 - 1600) =$$

$$\underline{\underline{\therefore \text{profit} = 400/=}}$$

$$\begin{aligned} (b) \quad \text{Work out the percentage profit} \\ \% \text{age profit} &= \frac{\text{profit}}{\text{C. price}} \times 100\% \\ &= \left[ \frac{400}{1600} \times 100 \right] \% \end{aligned}$$

- (ii)  $\therefore \text{profit} = 25\%$   
 Mulema bought a goat at 35,000/= and sold it at sh 32,000=
- (a) Find the loss.

$$\begin{array}{rcl} \text{Loss} & = & \text{Cost price} - \text{selling price} \\ & & 35000 - 32000 \\ & & \underline{700/-} \end{array}$$

- (b) Calculate the percentage loss  
 $\% \text{ loss} = \left[ \frac{\text{loss} \times 100\%}{\text{c.p}} \right] = \frac{700 \times 100\%}{350} = 20\%$   
 $\therefore \text{Loss} = 20\%$

### Activity

Fountain pg 86-87

Understanding pg 123-124

### Remarks

## LESSON 31

Subtopic:

Simple interest and amount

Content:

- Calculate the simple interest with emphasis on time in
    - (i) years
    - (ii) months
- $$\begin{array}{lcl} \text{S.I} & = & \text{principal} \times \text{time} \times \text{rate} \text{ i.e } P \times T \times \frac{R}{100} \\ & = & 1500 \times 3 \times \frac{8}{100} \\ & & \underline{100} \\ \text{S.I} & = & 3,600/- \end{array}$$

- (ii) Work out the simple interest offered to Tom who deposited 48000/= in a bank at an interest rate of 15% for 6 months.
- $$\begin{array}{lcl} \text{S.I} & = & P \times T \times R \text{ i.e } P = 48000/- \\ & & T = 6 \text{ months} = \frac{6}{12} \\ & & R = 15\% = \frac{15}{100} \\ & & \frac{240}{48000} \times \frac{6}{12} \times \frac{15}{100} \\ & & 240 \times 15 \\ \text{S.I} & = & 3600/- \end{array}$$

- (iii) Find the simple interest on 12000/- at a rate of 10% per year for 2 1/2 years.
- $$(a) \quad \text{S.I} = P \times T \times \frac{R}{100} = 12000 \times 2 \frac{1}{2} \times \frac{10}{100}$$

$$\begin{array}{rcl} & = & 600 \\ & & \frac{1200 \times 5}{2} \times 1 \\ & & \underline{2} = \text{SI} \quad 600 \times 5 = 3000/- \end{array}$$

- (b) How much money will it be after 2 1/2 years

$$\begin{array}{rcl} \text{Amount} & = & \text{S I} + \text{P} = 12000 \\ & & + 3000 \\ & & \underline{15,000} \end{array}$$

### Activity

Fountain pg 88

New Mk pg 83

Understanding pg 126-127

### Remarks

### Exercise 01 Revision questions on fractions

1. Change  $\frac{5}{2}$  to a mixed number.
2. What is  $1\frac{1}{2}$  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)  $\frac{3}{4}$  to a decimal fraction (b)  $2\frac{1}{4}$  to a decimal fraction.
5. Convert (a) 0.25 to a common fraction  
 (b) 1.25 to a common fraction.
6. Change  $\frac{2}{3}$  to a decimal fraction
7. What is 0.333—as a common fraction
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) $\frac{3}{5}, \frac{5}{6}, \frac{1}{5}, \frac{2}{3}$
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11. Arrange the following fractions in descending order.
 

(a) $\frac{2}{5}, \frac{5}{12}, \frac{5}{6}$	(b) $\frac{3}{4}, \frac{2}{3}, \frac{1}{6}$
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12. Add: (a)  $\frac{3}{8} + \frac{1}{4}$  (b)  $1\frac{1}{2} + 2\frac{1}{4}$
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)  $2\frac{1}{2} - 1\frac{3}{4}$   
(c)  $\frac{5}{6} - \frac{3}{8}$  (d)  $3\frac{1}{4} - 1\frac{2}{3}$
2. (a) What is the difference between three – quarters and a half  
(b) Subtract a quarter from  $\frac{1}{2}$
3. A farmer uses a half of his shamba for tomatoes,  $\frac{2}{3}$  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  $\frac{1}{2}$  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  $2\frac{1}{4} - \frac{2}{3} - \frac{5}{6}$
7. Work out (a)  $4 \div \frac{1}{3}$  (b)  $\frac{3}{8} \div 6$
8. Simplify: (a)  $\frac{3}{4} \div \frac{3}{5}$  (b)  $3\frac{1}{8} \div 3\frac{3}{4}$
9. Work out  $4\frac{1}{5} \div (1\frac{1}{6} + 2\frac{1}{3})$
10. Simplify:  $(2\frac{1}{2} + \frac{5}{6}) \div 1\frac{2}{3}$
11. Find the value of  $1\frac{1}{2} - 2\frac{1}{3} + 1\frac{1}{4}$
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)  $\frac{2}{3} - \frac{1}{2} \text{ of } \frac{1}{3}$  (d)  $\frac{3}{4} \text{ of } \frac{4}{5} - \frac{1}{6} \div \frac{1}{2}$   
(e)  $\frac{1}{3} \div \frac{1}{2} \text{ of } \frac{2}{3}$
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)  $2\frac{1}{2}$ ? (b)  $\frac{3}{5}$ ? (c)  $y$ ? (d)  $1\frac{1}{2}$ ? (e) 0.5?
  2. Use the reciprocal method and work out:  
(a)  $\frac{3}{4} \div \frac{1}{4}$  (b)  $1\frac{1}{3} \div 2\frac{1}{3}$
  3. Use the LCM method and simplify:  
(a)  $2\frac{1}{2} \div 1\frac{1}{4}$  (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)  $0.064 \div 0.06$
  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

8. (a)  $1 : 6$  (b)  $2 : 4$  (c)  $\frac{1}{2} \div \frac{1}{4}$  (b)  $0.2 : 0.4$   
Change the following fractions to ratios

(a)  $\frac{3}{4}$  (b)  $1\frac{1}{4}$  (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 dig a garden in 15 days. How many women can dig the same garden in 5 days at the same working rates?

14. A bus moving at a speed of  $60 \text{ km/hr}$  takes 2 hours to cover a certain distance. How long will the car take to cover the same journey at  $120 \text{ km/hr}$ ?

#### Exercise 06 Revision Exercise on Fractions

- Express (a) 4% as a fraction. (b)  $12\frac{1}{4}\%$  as a fraction
- Change the following fractions to percentages.  
(a)  $\frac{2}{5}$  (b)  $\frac{3}{4}$  (c)  $1\frac{1}{2}$
- Change the following as decimal fractions  
(a) 0.5 (b) 1.25 (c) 0.075 (d) 0.014
- Express the following as decimal fractions.  
(a) 0.2% (b) 0.25% (c) 2.45%
- Change the ratios below to percentages.  
(a)  $1 : 4$  (b)  $3 : 8$  (c)  $2 : 3$
- Convert the following percentages to ratios  
(a) 25% (b) 75% (c) 125%
- If 25% of a choir are female, what percentage are the male?
- 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
- What is 20% of  $1800/-$ ?
- Find 15% of an hour.
- Find  $12\frac{1}{2}\%$  of  $800/-$
- 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
- (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

- 15% of a number is 60. find the number
- 10% of my cattle are bulls. The bulls are 45. How many cattle are in my kraal?
- Increase 400 by 20%
- 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?
- Decrease 280 by 14%.
- 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%
- (a) Maizi bought a book at  $450/-$  and sold it at  $480/-$ . What was his profit?

8. (b) Find his percentage profit.  
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  $\frac{1}{2}$  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: DATA HANDLING

### LESSON 1

- Subtopic: Collection and Organization of data.
- Content:
- (i) Collection and recording information
  - (ii) Grouping information in a frequency table.

- Examples
- (iii) Organizing and recording information in a table.  
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		7
12		8
13		2
14		1

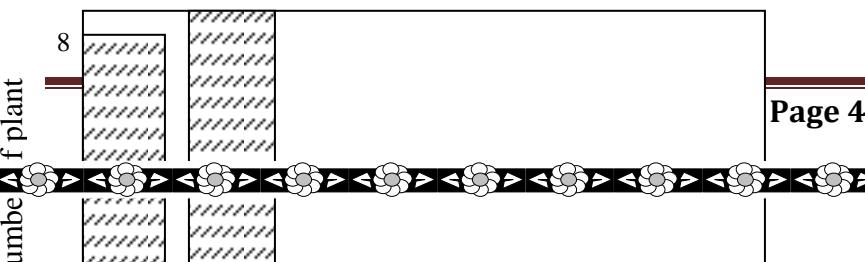
- (c) Organise the information in a table form

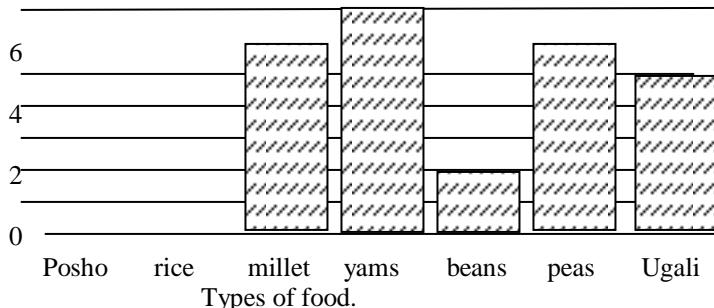
Age in years	10	11	12	13	14
Number of pupils (Frequency)	2	7	8	2	1

**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

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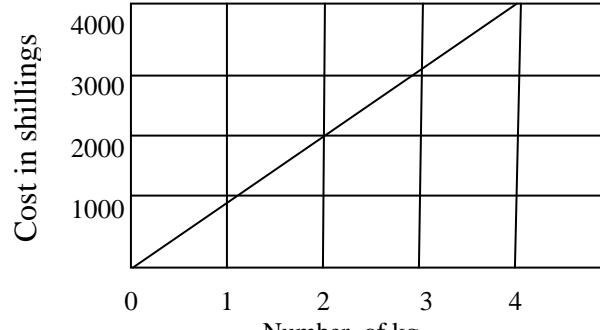
### LESSON 2

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

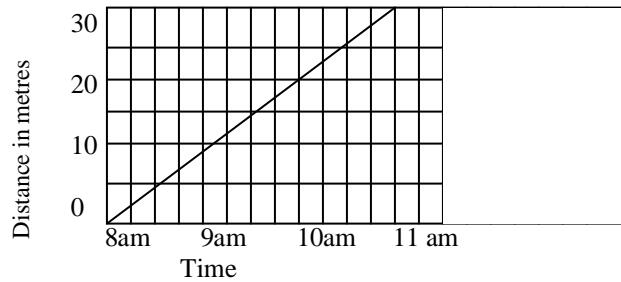
(d) What is the cost of 2 ½ kg of sugar?

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 edition 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

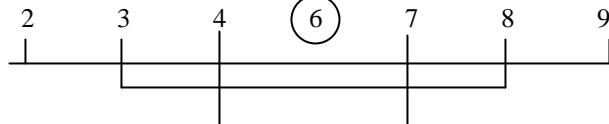
No	Tally	Frequency
2	//	2
4	/	1
5	/	1
6	///	3
8	/	1
9	/	1

The mode is 6

The modal frequency is 3.

- (b) Find the median of the following numbers

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



- (c) Find the mean (average) of the following numbers.

2, 4, 5, 6, 3, 8, 7

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

$$= 2 + 4 + 5 + 6 + 3 + 8 + 7 = 35$$

$$7 = \underline{\quad} 5$$

### LESSON 4

Subtopic:

Interpretation grouped data

Content:

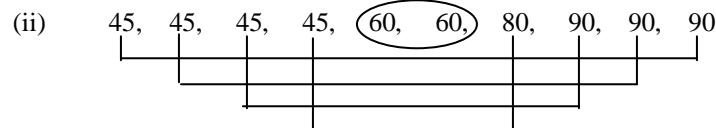
mode, median, range and mean

Example: The table below shows 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.



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

$$\text{(iii) Range} = H - L = 90 - 45 = 45$$

$$\begin{aligned} \text{(iv) Mean} &= \frac{(60 \times 2) + 80 + (90 \times 3) + (45 \times 4)}{10} \\ &= \frac{120 + 80 + 270 + 180}{10} \\ &= \frac{650}{10} = 65 \end{aligned}$$

### Activity

Trs' collection

### Remarks

## LESSON 5

Subtopic:  
Content:  
Example

Interpretation of information  
Inverse problems on average

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

Find q

$$q + 2 + 4 + 5 + 6 = 5$$

$$\begin{aligned} 5 \times \frac{q + 17}{5} &= 5 \times 5 \\ q + 17 &= 25 \\ q + 17 - 17 &= 25 - 17 \\ q &= 8 \end{aligned}$$

### 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:  
Content:  
Example:

Interpreting information

Inverse problems on average (cont)

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

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

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

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

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.

$$\begin{array}{lll} \text{The total mark of 4 pupils} & = 4 \times 6 & = 24 \\ \text{The total mark of 4 other pupils} & = 4 \times 8 & = 32 \\ \text{The total mark of 8 pupils} & = 24 + 32 & = 56 \\ \text{The average mark of 8 pupils} & = \frac{56}{8} & = 7 \end{array}$$

Sum = 36

### Activity

MK old edition pg 172-173

### Remarks

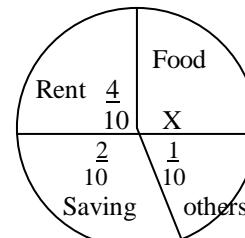
## LESSON 7

Subtopic:  
Content:  
Example

Pie chart

Interpreting pie chart involving fractions

The pie chart shows how a man spends sh 300,000



- (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

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

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

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

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

(ii) Expand on rent

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

$$= 120,000/-$$

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

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

$$\begin{array}{l} (\text{iii}) \text{ OR Food} \\ \frac{3}{10} \times 300,000 \\ 10 \\ = 90,000/- \end{array}$$

### others

$$\begin{array}{l} \frac{1}{10} \times 30,000 \\ 10 \\ = 30,000/- \end{array}$$

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

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

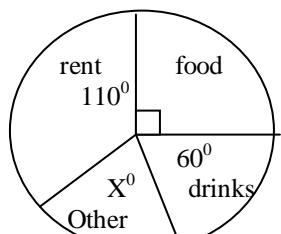
10

$$= 60,000/$$

$$90,000 - 30,000$$

$$= 60,000/$$

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?

$$\begin{aligned} (i) \quad & x + 60^\circ + 110^\circ + 90^\circ = 360^\circ \\ & X + 260 = 360 \\ & X + 260 - 260 = 360 - 260 \\ & X = 100^\circ \end{aligned}$$

$$\begin{aligned} \text{Either:} \\ (iii) \quad & 1100 = 600 = 500 \\ & \frac{1000}{360} = 50,000 \\ & \frac{50 \times 360,000}{360} = 50,000 \\ & 110,000 - 60,000 = 50,000 \end{aligned}$$

### 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  $x$

Food

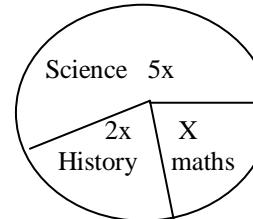
$$\begin{array}{c} 50\% \\ \hline 30\% \diagdown x \\ \text{Rent} \qquad \text{saving} \end{array}$$

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

- (ii) How much does he spend of rent?
- (iii) How much more does he spend on food than on rent?  
 $30\% \text{ of } 180,000 = \frac{30}{100} \times 180,000 = 54,000$

$$\begin{array}{c} \text{OR} \quad 50\% \text{ of } 180,000 = 20\% \text{ of } 180,000 \\ = \left( \frac{50}{100} \times 180,000 \right) - \left( \frac{20}{100} \times 180,000 \right) \\ = 90,000 - 36,000 = 54,000/ \end{array}$$

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?

$$\begin{aligned} (i) \quad & x + 2x + 5x = 320 \\ & 8x = 320 \\ & 8x = 320 \div 8 \\ & x = 40 \end{aligned}$$

$$\begin{aligned} (ii) \quad & 2x = 2 \times 40 \\ & = 80 \text{ pupils} \end{aligned}$$

$$\begin{aligned} (iii) \quad & 5x - 2x = 3x \\ & 3x = 3 \times 40 \\ & = 120^\circ \end{aligned}$$

$$\begin{array}{c} \text{OR} \quad 5x - 2x \\ = (5 \times 40) - (2 \times 40) \\ = 200 - 80 \\ = 120 \text{ pupils.} \end{array}$$

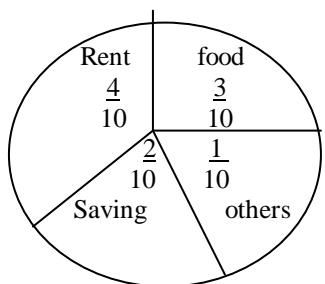
### LESSON 9

Subtopic:

Pie chart

Content: Interpreting pie chart involving fractions

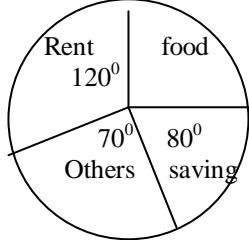
Example: The pie chart below shows how a man spends his salary. If he spends 60,000/= on food, how much does he earn?



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

Let his salary be  $y/$   
 $\frac{3}{10} \text{ of } y = 60,000/$   
 $10 \times \frac{10}{10} \times 3y = 60,000 \times 10$   
 $\frac{3y}{3} = \frac{60,000 \times 10}{3}$   
 $\underline{\underline{Y = 200,000/}}$

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  $x/$   
 $\frac{90}{360} \text{ of } x = 60,000/$

$$\frac{90}{360} \times \frac{1}{4} x = 60,000$$

$$4 \times \frac{x}{4} = 60,000/ \times 4$$

$$= X = 240,000/$$

(i) OR  
 $90^\circ$  represent 60,000/  
 $1^\circ$  represents  $\frac{60,000}{90}$   
 $360^\circ$  represent  $\frac{60,000}{90} \times 360 = 240,000/$

(ii)  $\frac{90}{360} \times 100\%$   
 $\frac{4}{4} \times 25$

$$\frac{1}{4} \times 400$$

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

Ref: trs' collection

## LESSON 10

Subtopic:

Content:

Example:

Pie chart.

Constructing pie chart

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.

$$\text{Sector for bananas} = \frac{25}{100} \times 360 = 5 \times 18 = 90^\circ$$

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

$$\text{Sector for beans} = \frac{15}{100} \times 360 = 3 \times 18 = 54^\circ$$

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

$$\text{Sector for maize} = \frac{20}{100} \times 360 = 2 \times 36 = 72^\circ$$

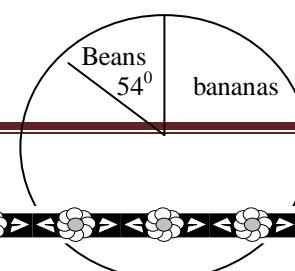
$$\frac{1}{1}$$

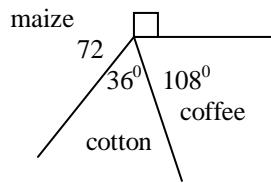
$$\text{Sector for cotton} = \frac{10}{100} \times 360 = 1 \times 36 = 36^\circ$$

$$\frac{1}{1}$$

$$\text{Sector for coffee} = \frac{30}{100} \times 360 = 3 \times 36 = 108^\circ$$

$$\frac{3}{3}$$





### Activity

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

### Remarks

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## LESSON 11

### Pie charts

#### Constructing pie charts.

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.

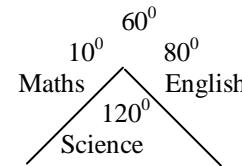
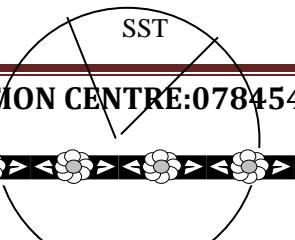
The total number of books =  $6 + 5 + 3 + 4 = 18$  books

$$\text{Sector for English books} = \frac{20}{18} \times 360^\circ = 4 \times 20^\circ = 80^\circ$$

$$\text{Sector for SST books} = \frac{20}{18} \times 360^\circ = 3 \times 20^\circ = 60^\circ$$

$$\text{Sector for English books} = \frac{20}{18} \times 360^\circ = 5 \times 20^\circ = 100^\circ$$

$$\text{Sector for English books} = \frac{20}{18} \times 360^\circ = 6 \times 20^\circ = 120^\circ$$



### 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

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## LESSON 12

### 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.

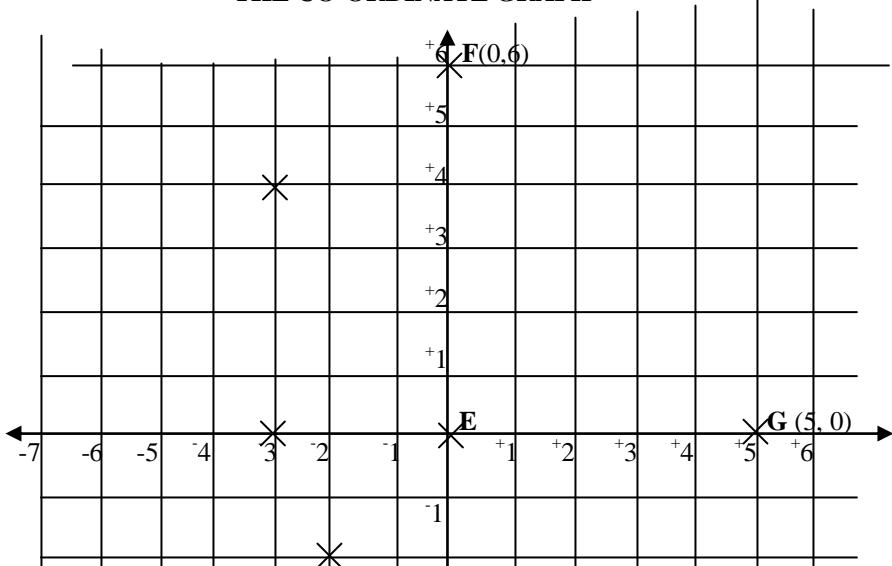
(c) Points co-ordinate

(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** 1<sup>st</sup> digit is found along the x – axis } to form the coordinates of a 2<sup>nd</sup> digit is found along the y – axis } a point.

### THE CO-ORDINATE GRAPH



**H** (-2, -2)

-3

**B** 4

-5

-6

**I** (0, 6)

Y – axis

### Activity

- Trs' collection

### Remarks

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### 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)

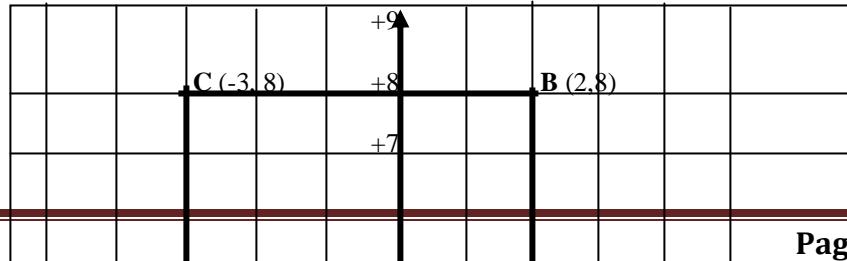
(b) Join the points (done)

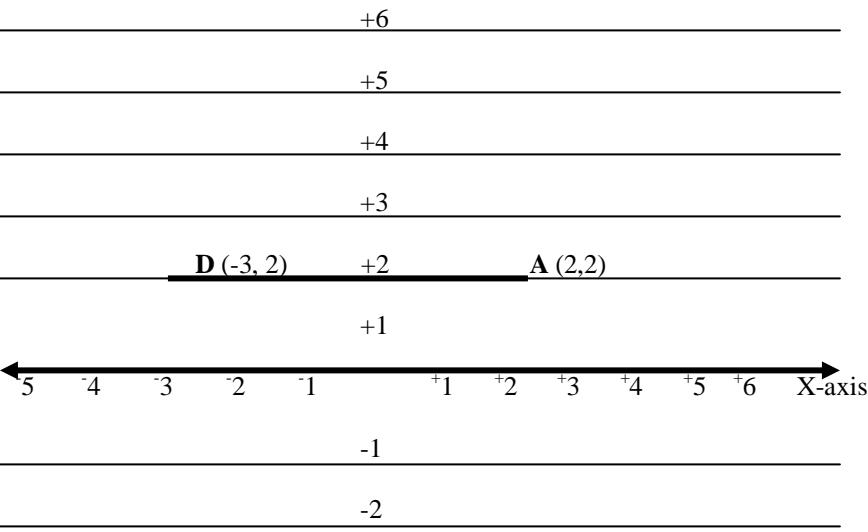
(c) Name the shape formed. (Rectangle)

(d) Calculate / find its area.

(e) What is its perimeter?

Y – axis





$$\begin{aligned} \text{Area of figure} &= \text{length} \times \text{width} \\ &= AB \times CD \\ &= 6 \text{ units} \times 5 \text{ units} \\ &= \underline{\underline{30 \text{ sq units}}} \end{aligned}$$

$$\begin{aligned} \text{Perimeter} &= 2(L + W) \\ &= 2(6 + 5) \text{ units} \\ &= 2 \times 11 \\ &= \underline{\underline{22 \text{ units}}} \end{aligned}$$

### Activity

Trs' collection

### Revision questions on graphs and interpretation of information

#### Exercise one

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

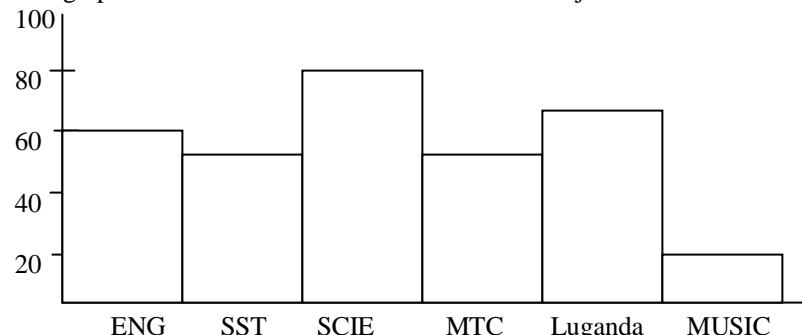
Mark	70	55	10	45	90
No of pupils	3		4	2	1

- How many pupils did the test
  - Find the modal mark
  - Find the modal frequency
  - What is the average mark
- The average of 3 numbers is 20. find the sum of the numbers.
  - 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.

- The mean of  $3y$ ,  $2y$ , 5 and 2 is 5. find the value of  $y$ .
- The mean of  $p$ ,  $(p+1)$ ,  $(p+2)$ ,  $(p+3)$ , 5 and 7 is 5. Find the value of  $p$ .

#### Exercise Two

- The graph below shows Roberts score in various subjects

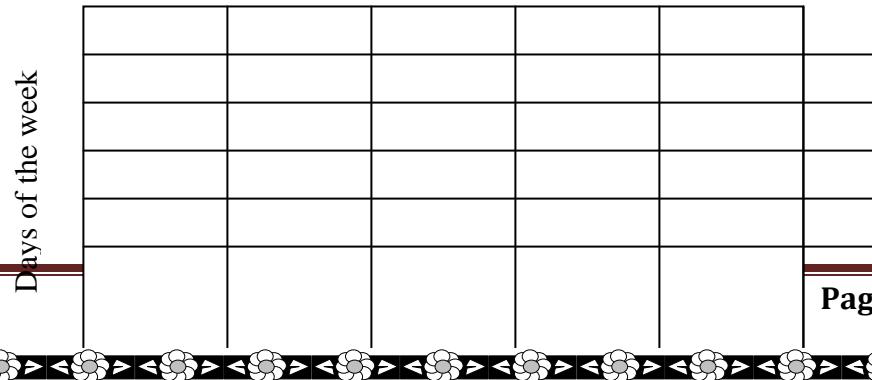


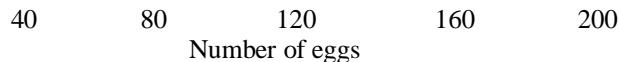
- How many marks did he score in Maths?
- In which subject did he perform best?
- Calculate Roberts average mark

- 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

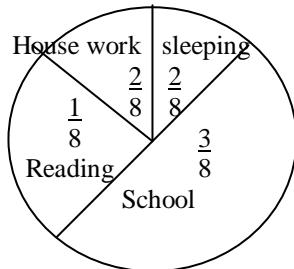
Represent the above information on the graph





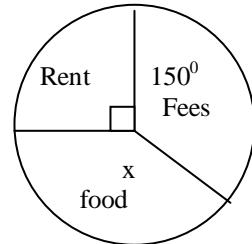
### Exercise Three - PIE CHARTS

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



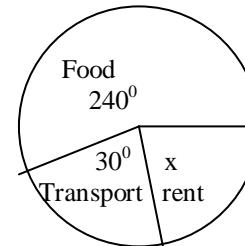
- (a) How many hours does Agudo spend sleeping?
- (b) How many more hours does she spend at school than doing house work?
- (c) If she reads 2 books in one hour, how many books does she read in a day?

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



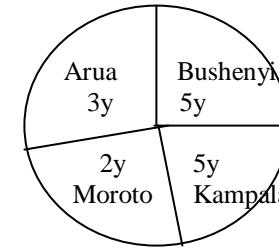
- (a) Find the value of X.
- (b) How much does he spend on rent?
- (c) What percentage of his income is used for food?

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.



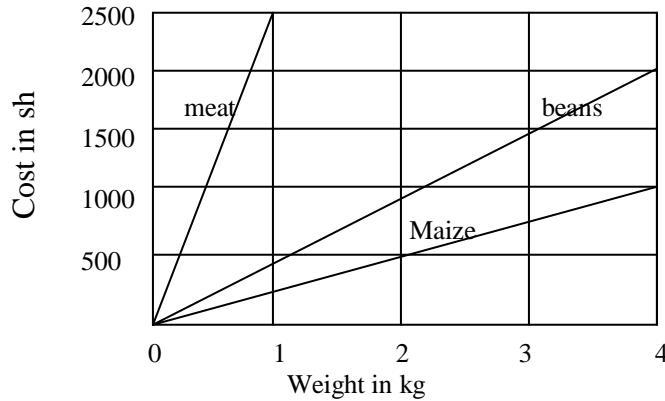
- (a) If 600 candidates passed in Moroto. How many candidates sat for the examination?
- (b) How many more candidates sat in Bushenyi than Arua

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.

7. 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

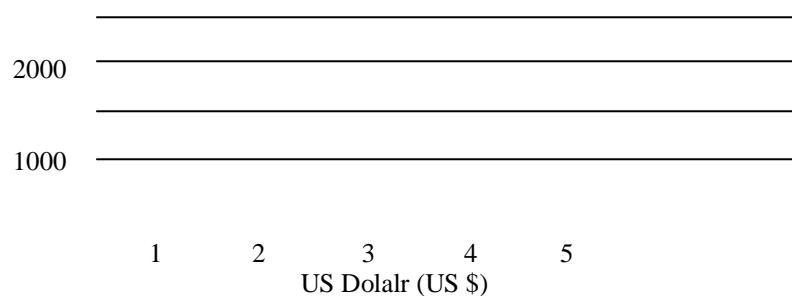
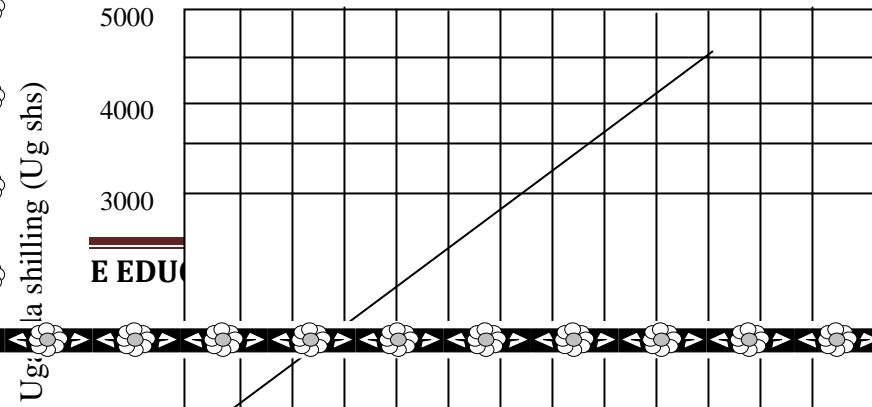
### EXERCISE FOUR – LINE GRAPH

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.

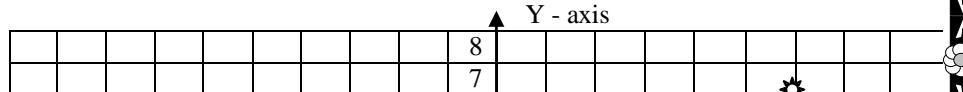
2. The graph below shows the exchange rate of Uganda shilling against one US dollar, use it to answer questions that follow.

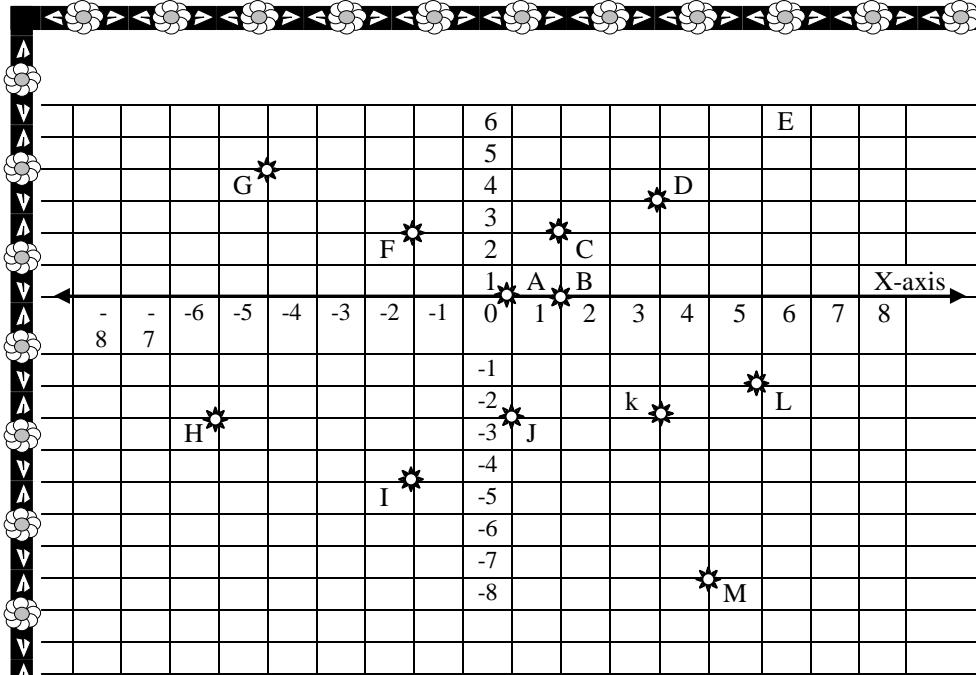


- (a) How many Uganda shillings are equivalent to US \$ 4.5 ?
- (b) Convert 2500 Uganda shillings to dollars.
- (c) Kasim bought a shirt at 3.5 dollar. Find the price in Uganda shillings.
- (d) How many Uganda shillings are equivalent to 1 US \$?

#### EXERCISE FIVE

Below is a coordinate graph



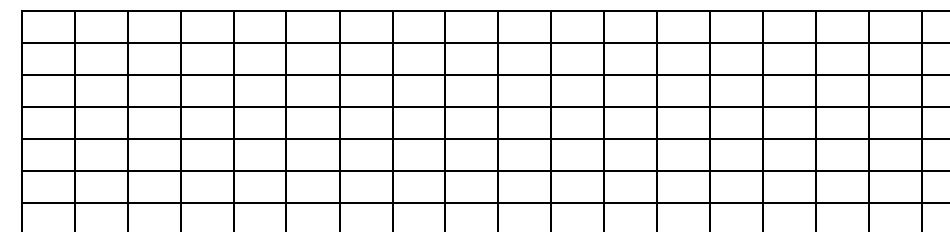


Write the coordinates of the points plotted in the graph.

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

Plot the following points on the graph

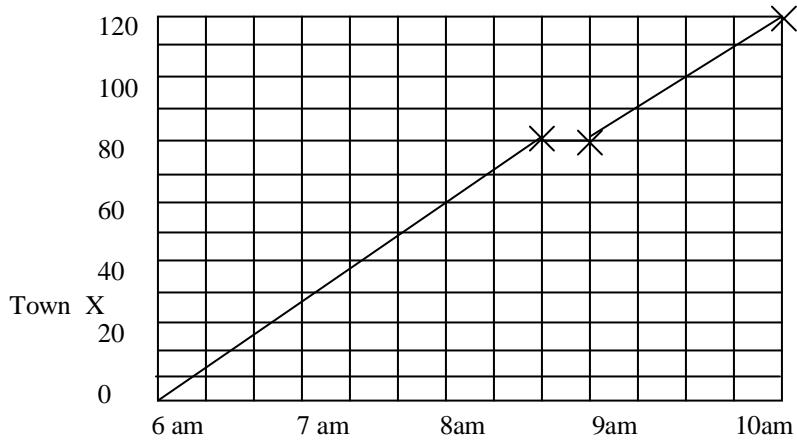
A (5, 2)	b (-2, 2)	C (-4, -1)	D (3, -1)
----------	-----------	------------	-----------



- Join A to B, B to C, C to D, D to A
- What name is given to the polygon formed?
- Calculate the area of polygon formed in square units.

#### **EXERCISE SIX (TRAVEL GRAPHS)**

The graph shows Emojong's journey from Pakwach to Kumi. Use it to answer questions that follow.

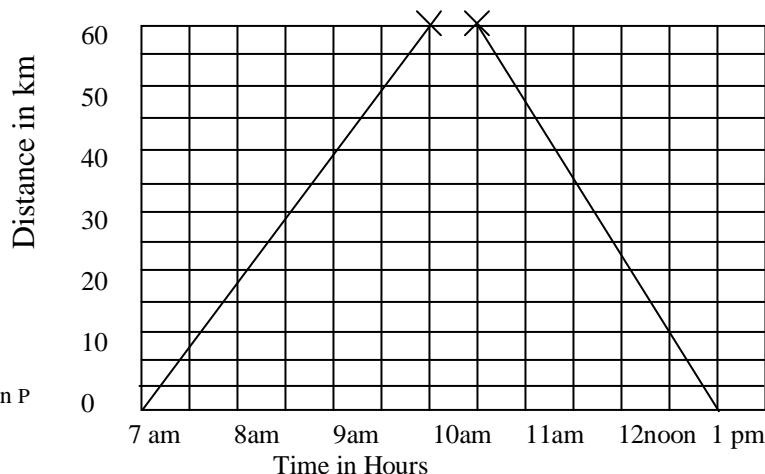


- At what time did Emojong arrive at town X?
  - For how long did he rest at town Y?
  - What distance had he covered by 6.20am?
  - Calculate his average speed for the whole journey.
2. A gate way bus leaves Soroti at 8:00am and travels at 60km/hr for 2 hours. The driver rests for half an hour. He then continues for another 1 1/2 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  
Town Q



- (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.

## UNIT / TOPIC: MEASURES

### LESSON 1

Subtopic: MONEY  
Content: Currencies.

Finding the number of notes/ denominations amount and its application in real life situation

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

No of notes = A 003881

P

- A 003782

P

                           99 without last note

Total No of Notes      = 99 + 1  
                              = 100 notes.

If denominations was worth shs 1000 per note then amount

$$\begin{aligned} &= 1 \text{ note} &= 1000 \\ &100 \text{ notes} &= 1000 \times 100 / \underline{\underline{=}} \\ &&= 100,000 / \underline{\underline{=}} \end{aligned}$$

### Activity

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

### Remarks:

### LESSON 2

Subtopic: MONEY  
Content: Uganda and other currencies  
Example: Country currency

COUNTRY	CURRENCY
Uganda	Uganda shillings (U.shs.)
Kenya	Kenya shilling (K.shs.)
Rwanda	RF
South Africa	ZAB
Zambia	Kwacha (Kch)
USA	US dollar

Britain	Pound sterling (£)
Japan	Japanese Yen (¥)
European Union	Euro (euro)
German	Deutsch Mark (DM)

### Rate

#### Needs updating the forex rates

Currencies	Buying	Selling
1 pound sterling (£)	Ug shs 2500	Ug shs 2550
1 US dollar (US \$)	Ug shs 1700	Ug shs 1720
1 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.

$$\text{£ } 1 = \text{Ug shs } 2500$$

$$\text{£ } 7650 = \text{Ug shs } 2500 \times 7650$$

$$\underline{\underline{\text{Ug shs } 19,125,000}}$$

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

#### Solution

Bureau is selling Euros to Tamu

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

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

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

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

$$= 8000$$

$$\frac{12480000}{1560} \text{ Euros}$$

$$= 8000 \text{ Euros}$$

### Activity

Fountain pg 117

Understanding pg 180-181.

### 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

#### 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

$$\begin{array}{r} - 00\ 00 \\ 4.\ 00\ am \\ \hline \end{array}$$

2. Express 1330 hours as am or pm  
13 30 hrs  
 $\begin{array}{r} - 12\ 00 \\ 1.\ 30\ pm \\ \hline \end{array}$

#### 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

$$\begin{array}{r} 18\ 30\ hrs \\ - 11\ 00\ hours \\ \hline 7.\ 30 \end{array} = 7\ hours\ 30\ minutes$$

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

$$\begin{array}{r} 16\ 10\ hours \\ - 13\ 59\ hours \\ \hline 2.\ 11 \end{array} = 2\ hours\ 11\ minutes$$

#### 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

$$\begin{aligned}\text{Distance} &= \text{speed} \times \text{time} \\ &= 60 \text{ km/hr} \times 3 \text{ hours} \\ &= 60 \times 3 \frac{\text{km}}{\text{hr}} \times \frac{\text{hr}}{1} \\ &\equiv 180 \text{ km.}\end{aligned}$$

2. A car takes  $2\frac{1}{2}$  hrs to cover a journey at a speed of 40 km/hr.  
Find the distance travelled.

$$\begin{aligned}\text{Speed} &= 40 \text{ km/hr} \\ \text{Time} &= 2\frac{1}{2} \text{ hrs} \\ \text{Distance} &= \text{speed} \times \text{time} \\ &= 40 \text{ km/hr} \times 2\frac{1}{2} \text{ hr} \\ &= 40 \times 2\frac{1}{2} \frac{\text{km}}{\text{hr}} \times \frac{1}{1} \\ &= 20 \\ &= 40 \times \frac{5}{2} \text{ km} \\ &\equiv 100 \text{ km}\end{aligned}$$

#### 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

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

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

$$\text{Time} = 3 \text{ hours}$$

$$\text{Distance} = 210 \text{ km}$$

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

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

$$= \frac{70}{1} \text{ km}$$

$$\begin{aligned}\text{Speed} &= 70 \text{ km/hr} \\ \text{Activity} &\\ \text{Pupils will do exercise 10 : 16 page 235 MK BK 6} \\ \text{New MK 114} \\ \text{Old edition 231-233.}\end{aligned}$$

#### 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  
 $\frac{\text{Distance}}{\text{Time}}$   
 $\frac{1 \text{ km}}{1000 \text{ m}} = \frac{1 \text{ hr}}{3600 \text{ sec}}$

$$\begin{aligned}70 \text{ km} &= 72 \times 1000 \text{ m} \\ &= 72000 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{Speed} &= \frac{\text{distance}}{\text{Time}} \\ &= \frac{72000 \text{ m}}{3600 \text{ sec}} \\ &= \frac{1}{20} \text{ m/sec} \\ &= 20 \text{ m/sec}\end{aligned}$$

#### Activity

Pupils will do exercise 10 : 17 page 236 MK BK 6.  
New MK 113

#### LESSON 6

Subtopic: Distance, Time, Speed

Content: Expressing m/sec as km/hr

Example: Express 100m/sec as km/hr

$$\text{Meaning} = 100 \text{ m in 1 sec}$$

$$\text{Distance}$$

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

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

$$100 \text{ m} = \frac{1}{100} \text{ km}$$

$$100 \text{ m} = \frac{1}{100} \text{ km}$$

$$= \frac{1}{10} \text{ km}$$

$$\begin{aligned}\text{time} &\\ 3600/\text{sec} &= 1 \text{ hr} \\ 1 \text{ sec} &= \frac{1}{3600} \text{ hr}\end{aligned}$$

$$\begin{aligned}
 \text{Speed} &= \frac{\text{distance}}{\text{Time}} & & = 0.1 \text{ km} \\
 &= \text{distance} \div \text{time} \\
 &= \frac{1 \text{ km}}{10 \text{ } \frac{1}{360} \text{ hr}} \\
 &= \frac{1}{10} \times \frac{360}{1} \text{ km/hr} \\
 &= \underline{\underline{360 \text{ km/hr}}}
 \end{aligned}$$

### Activity

New Mk pg 116  
Old Mk pg 236

**Remarks:**

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### LESSON 7

**SUBTOPIC:**

Distance, Time, Speed

Finding average speed.

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

Time = 2 hrs

Speed = 60 km/hr

Distance = speed x time

= 60 km/hr x 2 hrs

$$60 \times 2 \frac{\text{km}}{\text{hr}} \times \frac{1}{1}$$

Distance = 120 km

Fro journey

time = 3 hrs

speed = 60 km/hr

distance = speed x time

$$= 60 \text{ km/hr} \times 3 \text{ hrs}$$

$$= 60 \times 3 \frac{\text{km}}{\text{hr}} \times \frac{1}{1}$$

distance = 180 km

Average speed = total distance travelled

$$\begin{aligned}
 &= \frac{\text{Total time taken}}{120 + 180 \text{ km}} \\
 &= \frac{2 + 3 \text{ hrs}}{300 \text{ km}}
 \end{aligned}$$

$$\begin{aligned}
 &= \frac{60}{300} \text{ km} \\
 &\rightarrow 1 \text{ hr} \\
 &= \underline{\underline{60 \text{ km/hr}}}
 \end{aligned}$$

### Activity

New Mk 115

Old Mk 235

**Remarks:**

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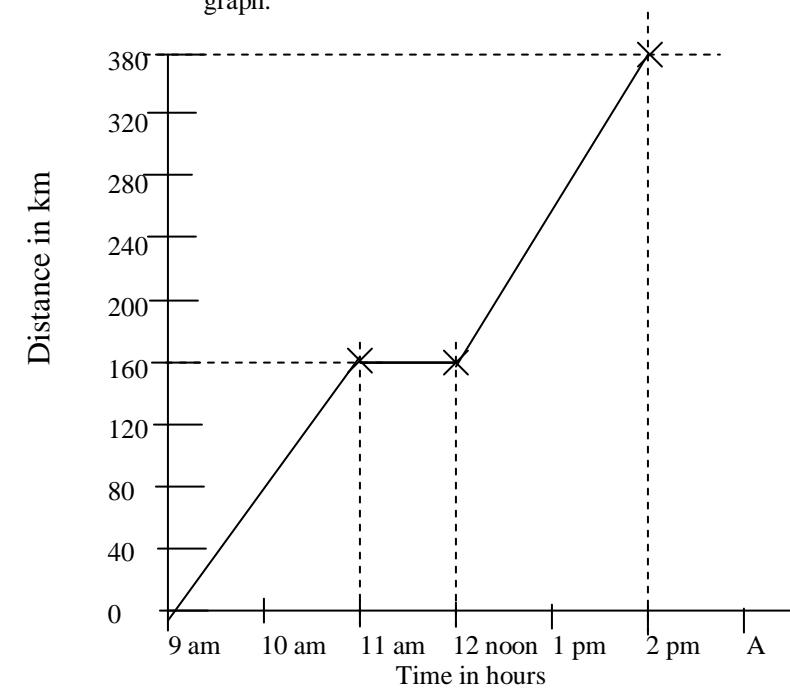
### LESSON 9

**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

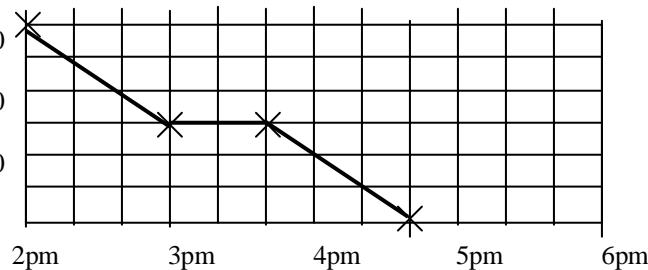
Content:

Interpreting return journeys on travel graphs

Examples:

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

Distance  
in Km



- (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?  
$$\frac{15 \text{ km}}{1 \text{ hr}} = 15 \text{ km/hr}$$
- (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

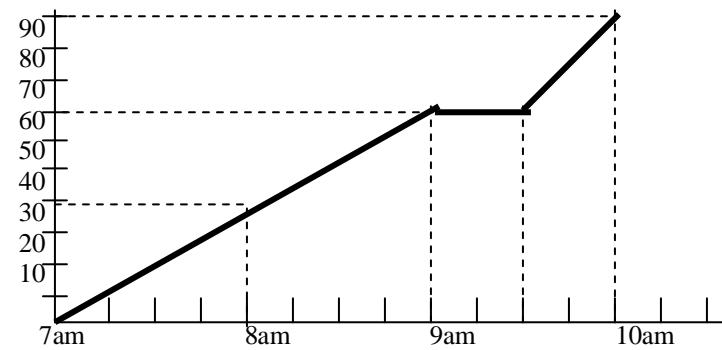
### LESSON 11

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 =  $\frac{90 \text{ km}}{3 \text{ hr}} = 30 \text{ km/hr}$

### Activity

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

### Remarks

## P.6 MTC TERM III

### TOPICAL BREAKDOWN FOR TERM III

Theme	Topic	Sub topic				Geometry	Lines, angles, and geometrical figures		
Measurements	Length, mass and capacity	<ul style="list-style-type: none"> <li>• Circumference</li> <li>• Measuring the length of a straight spring</li> <li>• Relationship between diameter and circumference ( ) pie of circle.</li> <li>• Finding circumference of a circle</li> <li>• Finding the radius and diameter when given circumference.</li> <li>• Area</li> <li>• Finding area of; <ul style="list-style-type: none"> <li>- Triangles</li> <li>- Rectangle</li> <li>- Trapezium</li> <li>- Parallelogram</li> <li>- Circle</li> <li>- Kite</li> </ul> </li> <li>• Volume</li> <li>• Finding value of; <ul style="list-style-type: none"> <li>- Cube</li> <li>- Cuboid</li> <li>- Cylinder</li> <li>- Triangular prism</li> </ul> </li> <li>• Capacity</li> <li>• Litres, half litres and quarter litres</li> <li>• Calculating capacity in litres and millilitres</li> </ul>				<ul style="list-style-type: none"> <li>• Parallel lines</li> <li>- Construction of parallel lines</li> <li>- Using a set square</li> <li>- Construction of parallel lines</li> <li>- Using a compass</li> <li>• Perpendicular lines</li> <li>- Constructing perpendicular lines, perpendicular bisector</li> <li>- Dropping a perpendicular line from point</li> <li>- Skew lines</li> <li>• Angles</li> <li>- Naming common arms and adjacent angles, supplementary angles , vertically opposite angles, and complementary angles.</li> <li>- Construction of angles of <math>90^\circ</math> , <math>60^\circ</math> and <math>120^\circ</math></li> <li>- Bisecting angles</li> <li>- Construction of angles of <math>30^\circ</math> , <math>45^\circ</math>, <math>135^\circ</math>, <math>15^\circ</math> , and <math>75^\circ</math> etc</li> <li>- Properties of triangles (types of triangles)</li> <li>- Pythagoras theorem</li> <li>- Constructing a right angled triangle</li> <li>• Geometric figures</li> <li>- Quadrilateral and their properties</li> <li>- Application of properties of quadrilaterals</li> <li>- Calculating angle of a rhombus and parallelogram</li> <li>- Construction of squares</li> <li>- Construction of a regular hexagon in a circle</li> <li>- Construction of a pentagon when given sides</li> <li>- Simple properties of prisms</li> <li>- Nets of simple prisms</li> </ul>			

Numeracy	Integers	<ul style="list-style-type: none"> <li>Integers on a number line</li> <li>Addition of integers</li> <li>Subtraction of integers</li> <li>Writing mathematical statements</li> <li>Addition and subtraction of integers without using a number line</li> <li>Application of integers</li> </ul>		
Algebra	Algebra	<ul style="list-style-type: none"> <li>Algebra (forming algebraic equations)</li> <li>Collecting like terms</li> <li>Substitution</li> <li>Simple equations (solving equations)</li> <li>By addition</li> <li>By subtraction</li> <li>By multiplication</li> <li>By division</li> <li>Equations involving brackets</li> <li>Forming and solving equations formed from polygons.</li> </ul>		

## 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  

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

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

$$2500m = \frac{1}{1000} \times 2500 \text{ km}$$

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

$$= 2.5 \text{ km}$$

(ii) Change 300 cm to m

$$100 \text{ cm} = 1 \text{ metre (m)}$$

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

$$300 \text{ cm} = \frac{1}{100} \times 300 \text{ m} \\ = 3 \text{ m}$$

### Activity

Pupils will do exercise 13.5 and 13.6 page 315 – 316 MK BK 6.  
Old Mk 315-316

### Remarks:

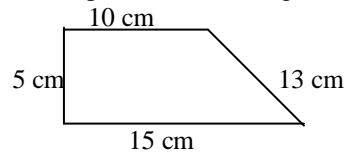
### LESSON 3

Subtopic:  
Content:  
Example:

Length

Perimeter of geometrical figures

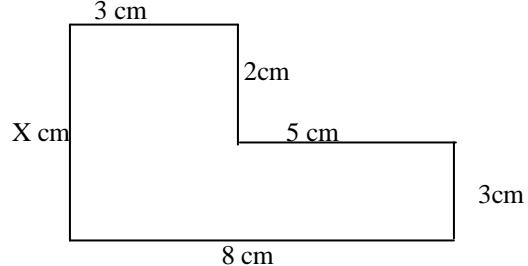
1. Find the perimeter of the figure below



Perimeter is the total distance around the figure.

$$\therefore \text{Perimeter} = S_1 + S_2 + S_3 + S_4 \\ = 15 \text{ cm} + 5 \text{ cm} + 10 \text{ cm} + 13 \text{ cm} \\ = 43 \text{ cm}$$

- (2) Find the perimeter



$$\text{Side } X = 2 + 3$$

$$X = 5 \text{ cm}$$

$$\begin{aligned} \text{Perimeter} &= S_1 + S_2 + S_3 + S_4 + S_5 + S_6 \\ &= 8\text{cm} + 3\text{cm} + 2\text{ cm} + 5\text{ cm} + 3\text{cm} + 5\text{ cm} \\ &= 26 \text{ cm} \end{aligned}$$

### Activity

Pupils will do exercise 13 : 12 and 13.13 page 320- 321 MK BK 6.  
Old Mk 320

New MK 125

### Remarks:

### LESSON 5

Subtopic:

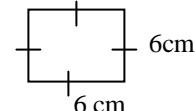
Content:

Example:

Area

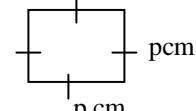
Area of shapes

Find the area of a square whose side is 6cm



$$\begin{aligned} \text{Area} &= \text{side} \times \text{side} \\ &= 6\text{cm} \times 6\text{cm} \\ &= 36 \text{ cm}^2 \end{aligned}$$

Find the area of a square whose side is p cm



$$\begin{aligned} \text{Area} &= \text{side} \times \text{side} \\ &= p\text{cm} \times p\text{ cm} \\ &= P^2 \text{ cm}^2 \end{aligned}$$

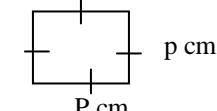
Content :

Example:

Find one side of the square.

The area of a square is  $64\text{cm}^2$ . Find the length of each side of the square.

Let one side be p cm



$$S \times S = \text{Area}$$

$$P \times P = 64$$

$$\sqrt{P^2} = \sqrt{64}$$

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

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

$$P = 8$$

Factorise

$$(2 | 64)$$

$$(2 | 32)$$

$$(2 | 16)$$

$$(2 | 8)$$

$$(2 | 4)$$

Each length = 8 cm

$$\begin{array}{r} (2 \ 2) \\ \hline 1 \end{array}$$

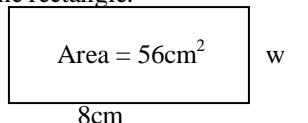
### Activity

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  $56\text{cm}^2$ . The length is 8cm. find the width of the rectangle.



$$L \times W = \text{Area}$$
$$8\text{cm} \times w = 56\text{cm}^2$$

$$\frac{8\text{cm}}{8\text{cm}} \times \frac{w}{8\text{cm}} = \frac{56\text{ cm}^2}{8\text{ cm}}$$

$$1 \qquad \qquad 1$$

$$W = 7 \text{ cm}$$

Width = 7 cm

11. A rectangular piece of paper is  $4800\text{mm}^2$ . Its width is 60 mm. Find its length

A diagram of a rectangle. The left side is labeled "60 mm". The top side is labeled "Area =  $4800\text{mm}^2$ ".

$$\text{Length} \times \text{width} = \text{Area}$$

$$L \times W = \text{Area}$$

$$L \times 60 \text{ mm} = 4800\text{mm}^2$$

$$\frac{L \times 60\text{mm}}{60\text{mm}} = \frac{4800\text{mm}^2}{60\text{mm}}$$

$$L = 80 \text{ mm}$$

L = 80 mm

Content:

Example: 2

Finding area when perimeter is given

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)  $2(L + W) = \text{perimeter}$

$$2(L + 5\text{cm}) = 24 \text{ cm}$$

$$2L + 10 \text{ cm} = 24 \text{ cm}$$

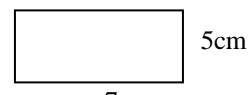
$$2L + 10 - 10 = 24\text{cm} - 10\text{cm}$$

$$2L = 14 \text{ cm}$$

$$\frac{2L}{2} = \frac{14}{2}$$

$$L = 7 \text{ cm}$$

Area



$$\text{Area} = L \times W$$

$$\text{Area} = 7\text{cm} \times 5 \text{ cm}$$

$$\text{Area} = 35 \text{ cm}^2$$

### Activity

Pupils will do exercise 13 :23 page 333 MK BK 6.  
New MK pg123-125

### Remarks:

### LESSON 7

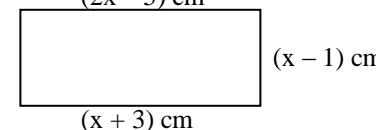
Subtopic: Area  
Content: Finding sides, Area and perimeter  
Example: ABCD is a rectangle.

Area

Finding sides, Area and perimeter

ABCD is a rectangle.

$$(2x - 5) \text{ cm}$$



- (i) Find the value of x  
(ii) Find width and length

(iii) Find the area of the figure

(i) Find the unknown

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

$$2x - x = 3 + 5$$

$$\underline{X = 8}$$

(ii) Length .  $x + 3$

$$8 + 3 = 11 \text{ cm}$$

Width:  $x - 1$

$$8 - 1 = 7 \text{ cm}$$

(iii) Area = L x W

$$= 11 \text{ cm} \times 7 \text{ cm}$$

$$\underline{77 \text{ cm}^2}$$

(iv) Perimeter =  $2(L + W)$

$$= 2(11 \text{ cm} + 7 \text{ cm})$$

$$2 \times 18 \text{ cm}$$

$$\underline{\text{Perimeter} = 36 \text{ cm}}$$

### Activity

Pupils will do exercise 13 :24 page 334 - 335 MK BK 6.

Tr's collection

### Remarks:

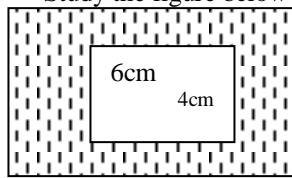
### LESSON 8

Subtopic:

Area

Finding area of shaded part.

Content: Study the figure below carefully.



9cm

Find the area of the shaded part.

10 cm

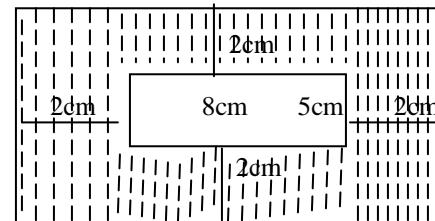
$$\begin{aligned}\text{Area of outer rectangle} &= L \times W \\ &= 10 \text{ cm} \times 9 \text{ cm} \\ &= \underline{90 \text{ cm}^2}.\end{aligned}$$

$$\begin{aligned}\text{Area of inner rectangle} &= L \times W \\ &= 6 \text{ cm} \times 4 \text{ cm}\end{aligned}$$

$$= \underline{24 \text{ cm}^2}$$

$$\begin{aligned}\text{Area of shaded part} &= 90 \text{ cm}^2 - 24 \text{ cm}^2 \\ &= \underline{66 \text{ cm}^2}\end{aligned}$$

2.



Find area of shaded part.

Length of outer rectangle =  $8\text{cm} + 2 + 2\text{cm}$

$$\begin{aligned}\text{Width of outer rectangle} &= 12 \text{ cm} \\ &= 5 + 2 + 2 = 9 \text{ cm}\end{aligned}$$

$$\begin{aligned}\text{Area outer rectangle} &= L \times W \\ &= 12 \text{ cm} \times 9 \text{ cm} \\ &= \underline{108 \text{ cm}^2}\end{aligned}$$

$$\begin{aligned}\text{Area of shaded part} &= 108 \text{ cm}^2 - 40 \text{ cm}^2 \\ &= \underline{68 \text{ cm}^2}\end{aligned}$$

### Activity

Pupils will do exercise 13 :25 Nos 1 - 6 page 337 in MK BK 6.

Understanding pg 262-263

Remarks: Use a variety of units

### LESSON 9

Subtopic:

Area

Finding area of a triangle

Content:

Examples:

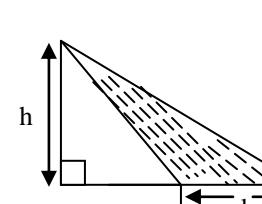
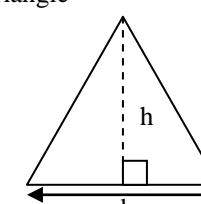
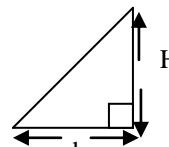
Area

Finding area of a triangle

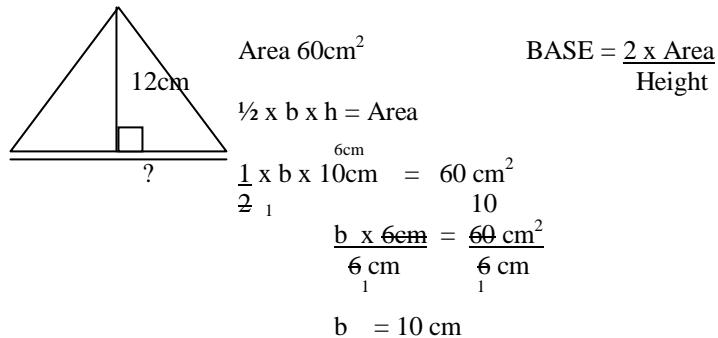
b

H

$$\text{Area is } \frac{1}{2} \times b \times h$$



Examples: 2 Find the base of a triangle whose area is  $60\text{cm}^2$  and height is 12cm  
Diagrammatic representation



#### Activity

Pupils will do exercise 13 :27 page 339 to 340 MK BK 6.

New MK 127

Fountain 135-136

**Remarks:**

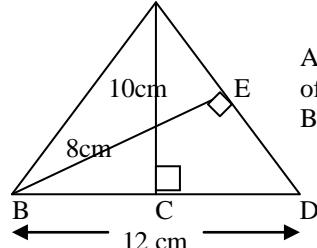
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#### LESSON 10

Subtopic: Area  
Content: Finding Base or Height by comparing area

Example:  

ABC is a triangle AC and BE are heights of the same triangle.  
 $BD = 12\text{cm}$ ,  $AC = 10\text{cm}$   $BE = 8\text{cm}$   
Find the length of AD



Area triangle ABD with height AC =  $\frac{1}{2}bh$   
Area Triangle ABD with height BE =  $\frac{1}{2}bh$

} same triangle with different heights has the same area.

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

4cm

6

$$\begin{aligned} \frac{1}{2}AD \times 8\text{cm} &= \frac{1}{2} \times 12\text{cm} \times 10\text{cm} \\ AD \times 4\text{cm} &= 60\text{cm} \\ \frac{1}{4}AD \times 4\text{cm} &= \frac{60}{4}\text{cm} \\ AD &= 15\text{cm} \end{aligned}$$

#### Activity

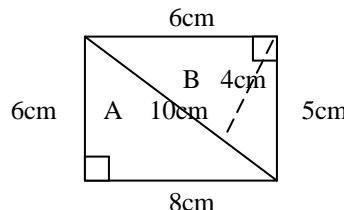
Pupils will do exercise 13 :28 page 342 MK BK 6.

**Remarks:**

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#### 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

$$\text{Area A} = \frac{1}{2} \times b \times h$$

$$\begin{aligned} \frac{1}{2} \times 8\text{cm} \times 6\text{cm} &= 24\text{cm}^2 \\ &= 24\text{cm}^2 \end{aligned}$$

$$\text{Area B} = \frac{1}{2} \times b \times h$$

$$\begin{aligned} \frac{1}{2} \times 10\text{cm} \times 4\text{cm} &= 5\text{cm} \times 4\text{cm} \\ &= 20\text{cm}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of whole figure} &= \text{AA} + \text{AB} \\ &= 24\text{cm}^2 + 20\text{cm}^2 \\ &= 44\text{cm}^2 \end{aligned}$$

### Activity

Pupils will do exercise 13 :29 page 343 MK BK 6.

Understanding mtc pg 258

### Remarks:

### LESSON 12

Subtopic:

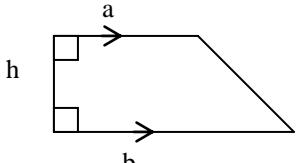
Area

Content:

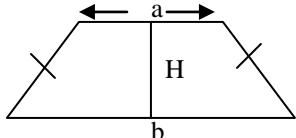
Area of a trapezium

Examples:

Trapezium are of two types.



right angled trapezium

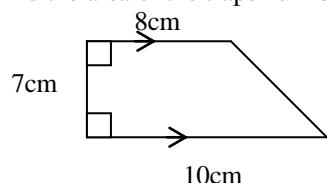


isosceles trapezium

Find the area of the trapezium below

$$\text{Area} = \frac{1}{2} h (a + b)$$

Find the area of the trapezium below



$$\begin{aligned}\text{Area} &= \frac{1}{2} h (a + b) \\ &= \frac{1}{2} \times 7\text{cm} (8 + 10\text{cm}) \\ &= \frac{1}{2} \times 7 \times 18 \text{ cm}^2 \\ &\equiv 63\text{cm}^2\end{aligned}$$

Content:

Examples:

Finding one side of a trapezium

The area of a trapezium is  $60\text{cm}^2$ , the height is 4cm and one of the parallel sides is 10cm. find the length of the second parallel side.



4 cm

$$\frac{1}{2} h (a + b) = \text{Area}$$

$$\frac{1}{2} \times 4\text{ cm} (a + 10) = 60\text{cm}^2$$

$$2\text{cm} (a + 10) = 60\text{ cm}^2$$

$$2\text{acm} + 20\text{cm} = 60\text{cm}^2$$

$$2\text{acm} + 20 - 20 = 60 - 20$$

$$2a = 40$$

$$\frac{2a}{2} = \frac{40}{2}$$

$$a = 20\text{ cm}$$

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

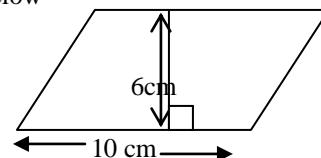
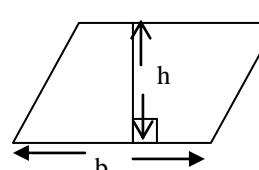
Content:

Area of parallelograms

Examples:

AREA OF PARALLELOGRAM = BASE X HEIGHT

Find the area of the figure below



$$\begin{aligned}\text{area} &= \text{BASE} \times \text{HEIGHT} \\ &= 10\text{ cm} \times 6\text{ cm} \\ \text{Area} &= 60\text{cm}^2\end{aligned}$$

### Activity

Pupils will do exercise 15 : 32 page 347 MK BK 6.

New Mk 129

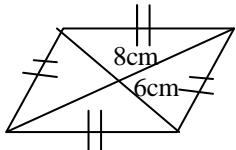
Remarks

### LESSON 14

Content : Area of rhombus and kite

Example 1.

Find the area of the rhombus below



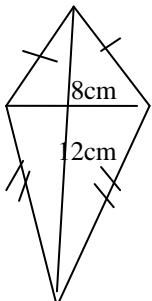
$$\text{Area} = \frac{1}{2} d_1 \times d_2$$

$$= \frac{1}{2} \times 8\text{cm} \times 6\text{cm}$$

$$= 4\text{cm} \times 6\text{cm}$$
$$= 24\text{cm}^2$$

Example II

Find the area of the kite



$$\text{Area} = \frac{1}{2} d_1 \times d_2$$

$$= \frac{1}{2} \times 8\text{cm} \times 12\text{cm}$$

$$= 4\text{cm} \times 12\text{cm}$$
$$= 48\text{cm}^2$$

Ref: New Mk pg 130

### LESSON 15

Subtopic: length

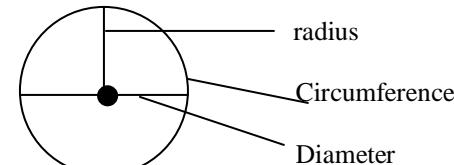
Content: Circumference - Diameter  
Radius

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.

$$\text{Radius} = \frac{\text{diameter}}{2}$$
$$= \frac{40}{2}$$
$$= \underline{20}$$
$$= \underline{\text{radius} = 20 \text{ cm}}$$

(ii)

Find the diameter of circle whose radius is  $3\frac{1}{2}$  cm

$$\text{Diameter} = 2 \times r$$
$$= 2 \times 3\frac{1}{2}$$
$$= \frac{1}{2} \times 7$$
$$= \underline{7 \text{ cm}}$$
$$\text{Diameter} = \underline{7 \text{ cm}}$$

Content:

Examples:

Calculating circumference of a circle

(i) Find the circumference of a circle whose diameter is

10 cm. (Use  $\pi = 3.14$ )

Diameter = 10 cm

$$\begin{aligned}\text{Circumference} &= \pi D \\ &= 314 \times 10 \text{ cm} \\ &= \frac{314}{100} \times 10 \text{ cm} \\ &\equiv 31.4 \text{ cm}\end{aligned}$$

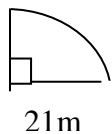
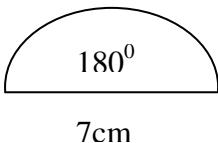
Ref: understanding mtc pg 254-257  
New MK pg 132

### LESSON 16

Content: perimeter of sectors of a circle

Example 1

Find the perimeter of these shapes ( $\pi = \frac{22}{7}$  or 3.14)



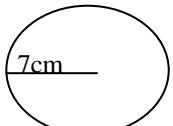
Ref: Mk new Mk pg 133

### LESSON 17

Content: finding the area of a circle

Example 1

Find the area of the circle



$$\begin{aligned}A &= \pi r^2 \\ &= \frac{22}{7} \times 7 \times 7 \\ &= 22 \times 7\end{aligned}$$

$$= 154 \text{ cm}^2$$

Example 2  
Calculate the area of the circle below (take  $\pi = 3.14$ )

20cm

$$\begin{aligned}A &= \pi r^2 \\ &= 3.14 \times 10 \times 10 \\ &= \frac{314}{100} \times 100 \\ &= 314 \text{ cm}^2\end{aligned}$$

Ref: new MK 134

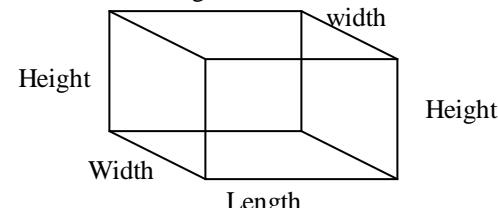
### LESSON 18

Subtopic:

Content:

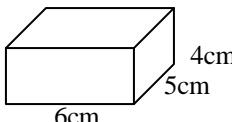
Examples:

Area  
Finding total surface Area  
Cuboid length



A rectangular box has 6 faces  
2 faces of length and width

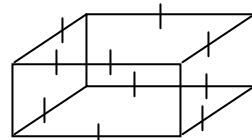
2 faces of width and height  
 2 faces and length and height  
 $2(\text{length} \times \text{width}) + 2(\text{width} \times \text{height}) + 2(\text{length} \times \text{height})$   
 $2(L \times w) + 2(w \times h) + 2(l \times h)$   
 $\text{TSA} = 2(LW) + 2(Wh) + 2(Lh)$



$$\begin{aligned}\text{TSA} &= 2(lw) + 2(wh) + 2(hl) \\ &= (2 \times 6 \times 5) + (2 \times 5 \times 4) + (2 \times 6 \times 4) \text{ cm}^2 \\ &= 60 + 40 + 48 \text{ cm}^2 \\ \underline{\text{TSA}} &= \underline{148 \text{ cm}^2}\end{aligned}$$

Content:  
 Examples: Total Surface Area of a Cube

- Cube
- Cube has all edges equal
  - Cube has all its faces equal
  - Each face is a square



It has 6 equal faces  
 $\text{Area of one face} = S \times S$   
 $= S^2$  where  $S$  is side  
 $\therefore 6$  faces will have area  $6 \times S^2$   
 $\therefore \text{TSA of cube} = 6S^2$

Find the total surface area of a cube whose side is 4cm

$$\begin{aligned}\text{TSA} &= 6 \times S^2 \\ \text{TSA} &= 6 \times 4^2 \\ \text{TSA} &= 6 \times 4 \times 4 \text{ cm}^2 \\ \text{TSA} &= \underline{96\text{cm}^2}\end{aligned}$$

### 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:  
 Examples:

Finding sides of a cube

The total surface area of a cube is  $384\text{cm}^2$ . Find the length of each side of a square.

$$\begin{aligned}\text{TSA} &= 384\text{cm}^2 \\ \text{But } 6S^2 &= \text{TSA}\end{aligned}$$

$$\frac{1}{6}S^2 = \frac{64}{6}$$

$$S^2 = 64$$

$$\begin{aligned}\sqrt{S^2} &= \sqrt{64} \\ S &= 8\text{cm}\end{aligned}$$

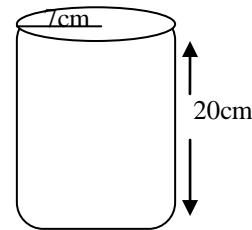
### Activity

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



$$\begin{aligned}A &= \pi r^2 h \\ &= \frac{22}{7} \times 7 \times 7 \times 20 \\ &= 22 \times 7 \times 20 \\ &= 154 \times 20 \\ &= 3080\text{cm}^3\end{aligned}$$

Ref: new Mk pg 137

### LESSON 20

Subtopic:

Capacity

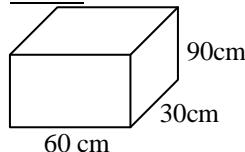
Content: Volume (3 dimensional figures.)

Example:

A rectangular tank is 30cm by 60 cm by 90 cm. Find its capacity

litres.

Sketch



$$\text{Volume of the tank} = L \times w \times h \\ = (30 \times 60 \times 90) \text{ cm}^3$$

$$1 \text{ litre} = 1000 \text{ cm}^3 \\ \text{No of litres in the tank} \\ = \frac{30 \times 60 \times 90}{1000} \\ = 162 \text{ litres}$$

### 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

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### LESSON 21

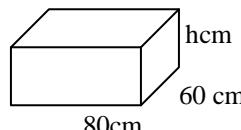
Subtopic:

Capacity

Content: application of volume and capacity

Example:

The rectangular tank below holds 72 litres of water. Calculate the volume of h.



1 litre =  $1000 \text{ cm}^3$

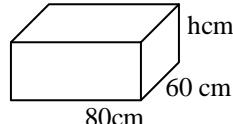
The volume of water in the tank is  $(72 \times 1000) \text{ cm}^3$ .

Therefore  $80 \times 60 \times h = 72 \times 1000$

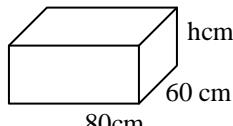
$$\begin{array}{rcl} & 9 & 3 & 5 \\ h & = & \underline{\underline{72}} & \times 1000 \\ & 80 & \times 60 & \\ & 1 & 2 & 1 \end{array}$$
$$\underline{\underline{h}} = 15 \text{ cm}$$

### Activity

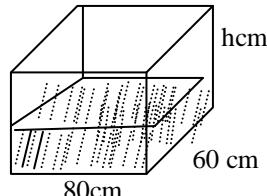
1. The tank below holds 72 litres of water.. find h.



2. The tank below holds 280 litres of water find h.



3. The tank below is  $\frac{1}{3}$  full of water. How many litres of water are in the tank?



Ref: old Mk pg 359-360

Understanding pg 266-268

Remarks

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### LESSON 23

Subtopic:

Capacity

Content: Conversion of  $\text{cm}^3$  to litres

Examples (a) Change  $2000 \text{ cm}^3$  to litres

$$\begin{array}{rcl} 1000\text{cm}^3 & = & 1 \text{ litres} \\ 1 \text{ cm}^3 & = & \left(\frac{1}{1000}\right) \text{ litres} \\ 2000\text{cm}^3 & = & 1 \times 2000 = 2 \text{ litres} \\ & & \frac{1000}{1000} \end{array}$$

Solution: (b) Change  $3700\text{cm}^3$  to litres

$$\begin{array}{rcl} 1000\text{cm}^3 & = & 1 \text{ litres} \\ 1 \text{ cm}^3 & = & \left(\frac{1}{1000}\right) \text{ litres} \\ 3700\text{cm}^3 & = & \frac{1}{1000} \times 3700 = \frac{37}{10} = 3.7 \text{ litres} \end{array}$$

**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

$$\begin{aligned} 1000\text{ml} &= 1 \text{ litre} \\ 1 \text{ ml} &= \left( \frac{1}{1000} \right) \text{ litres} \\ 3500\text{ml} &= \left( \frac{1}{1000} \times 3500 \right) \text{ litres} \\ &= \frac{35}{10} = 3.5 \text{ litres} \end{aligned}$$

(b) Express 900 ml as litres.

$$\begin{aligned} 1000\text{ml} &= 1 \text{ litre} \\ 1 \text{ ml} &= \left( \frac{1}{1000} \right) \text{ litres} \\ 900\text{ml} &= \left( \frac{1}{1000} \times 900 \right) \text{ litres} \\ &= \frac{9}{10} = 0.9 \text{ litres} \end{aligned}$$

Content:

Conversion of litres of ml

Example:

(a) Change 5 litres to ml.

$$\begin{aligned} 1 \text{ litre} &= 1000\text{ml} \\ 5 \text{ litres} &= (1000 \times 5) \text{ ml} \\ &= \underline{\underline{5000 \text{ mls}}} \end{aligned}$$

(b) Change 0.25 litres to ml

$$\begin{aligned} 1 \text{ litre} &= 1000\text{ml} \\ 0.25 \text{ litres} &= (0.25 \times 1000) \text{ ml} \\ &= \frac{25}{100} \times 1000 \\ &= \underline{\underline{250 \text{ ml}}} \end{aligned}$$

(c) Change 3  $\frac{1}{2}$  litres to ml

$$1 \text{ litre} = 1000\text{ml}$$

$$3 \frac{1}{2} \text{ litres} = 1000 \times 3 \frac{1}{2}$$

$$\begin{aligned} &\frac{7}{2} \times \frac{500}{2} \\ &= 7 \times 500 \\ &= \underline{\underline{3500\text{ml}}} \end{aligned}$$

**Activity**

Pupils do exercise 13.42 No 1 – 16 on page 362 of a New MK pupils Bk 6 (New ed)

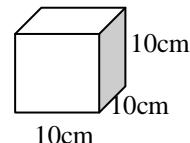
**Remarks****LESSON 25****SUBTOPIC: PACKING**

Content: volume

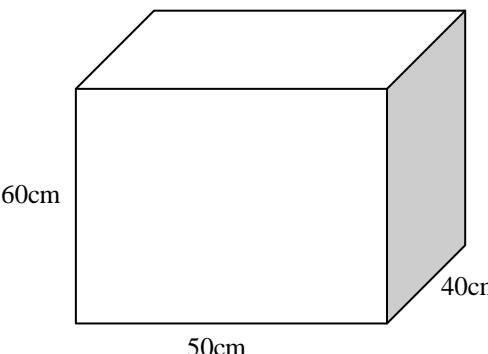
Examples

Containers A are to be packed in a big container B

A



B



- a) Find the number of small containers that can be packed in B.  
 b) How many containers A of water can fill container B?

**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 with 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  $1\frac{1}{2}$  hrs from Kitgum to Lira and  $\frac{1}{2}$  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.

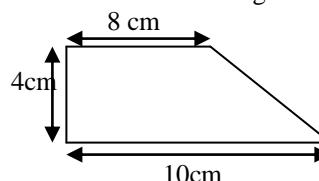
**Set 4**

1. Express 6km as metres.
2. One side of a regular hexagon is 8 cm. What is the total distance round it?

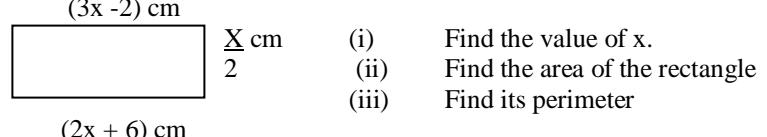
3. A triangular field has a base of 15m and its height 12m. what is the area of the field?

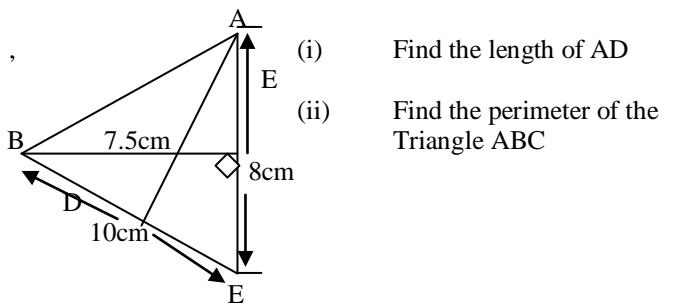
4. Calculate the circumference of a round table top whose diameter is 1.4m?

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.



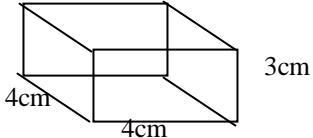


**Set 5**

1. Express  $2\frac{1}{2}$  litres as millilitres.

2. Write  $15000 \text{ cm}^3$  as litres.

3. Find the volume of the figure below.

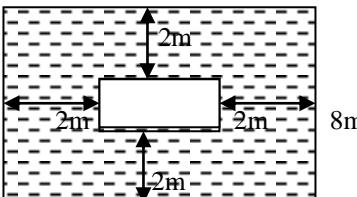


3cm

4. A field is  $40\text{m}^2$ . what is the area in  $\text{cm}^3$

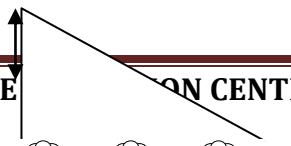
5. A road is 8 km long. What is this distance in metres?

6.

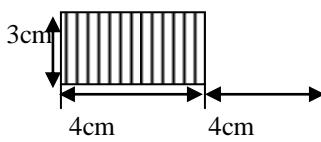


- (i) Find the width of the inner rectangle  
(ii) Find the area of the shaded part

7. Find the area of the shaded part in the diagram below



3cm



8. Change  $6.045\text{kg}$  to grams.  
9. A square room is  $3.6\text{ m}$  long. What is its area?  
10. Find the height of triangle whose area is  $30\text{cm}^2$  and its base is 12cm.

## THEME: Geometry

### Topic: LINES , ANGLES AND GEOMETRIC FIGURES

#### UNIT 9

##### LESSON 1

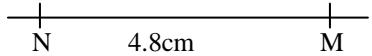
Subtopic:  
Content:

Shapes

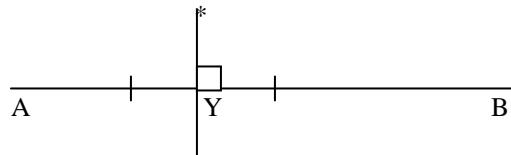
- (i) Types of lines  
(a) line, line segment, ray, curves  
(b) perpendicular lines  
(c) parallel lines  
(d) Drawing line  
(e) Skew lines

Examples:

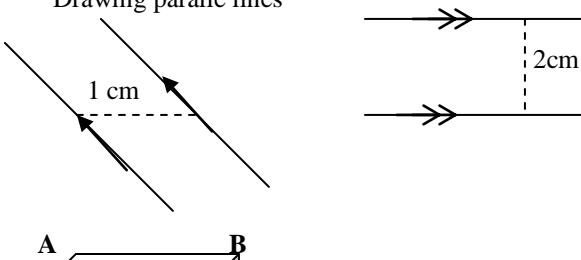
- (a) Draw a line segment of 4.8 cm



- (b) Draw a perpendicular line to AB at Y



- (c) Drawing parallel lines



F

G

line AB and GD are skew lines

E

D

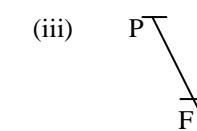
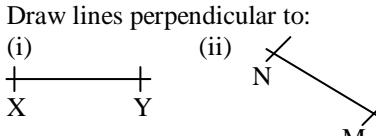
C

#### 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:



- (c) Draw a parallel lines which are apart by

- (i) 2cm (ii) 3cm (iii) 4cm (iv) 1.5cm and 2cm

#### Remarks

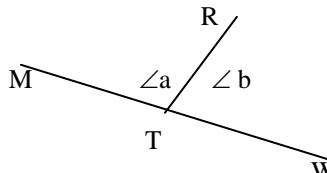
Fountain pg 152-153

#### LESSON 2

##### Subtopic: Angles

Content:  
- Formation and naming angles  
- measuring and drawing angles using a protractor

Example: (a) study the figure below



$\angle a$  is MTR or RTM

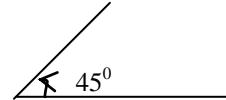
angles b is RTW or WTR

- (b) Measure each angle in degrees:

angle "a" =  $102^\circ$

angle "b" =  $78^\circ$

- (c) Measure and draw an angle of  $45^\circ$ .



#### Activity

(i) Draw the following angles using a protector  
 $20^\circ$     $30^\circ$     $80^\circ$     $120^\circ$     $100^\circ$     $65^\circ$     $35^\circ$     $45^\circ$     $72^\circ$

#### Remarks

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### LESSON 3

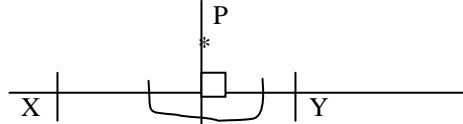
#### SUBTOPIC:

Bisecting line segments and angles

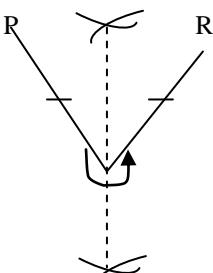
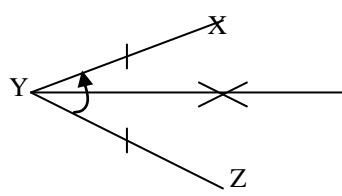
- Bisect lines at a point.
- Drop bisector from a point
- Bisect given angles.

#### 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)  $60^\circ$                       (b)  $150^\circ$

(ii) (a)  $45^\circ$                       (b)  $30^\circ$

(iii) Construct an angle of  $120^\circ$  at point T

### Activity

Pupils will do exercise 6 on page 144 from Oxford primary MTC pupils BK 6.  
 Fountain pg 147

#### Remarks

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### LESSON 5

#### Subtopic:

Construction of polygons

#### Content:

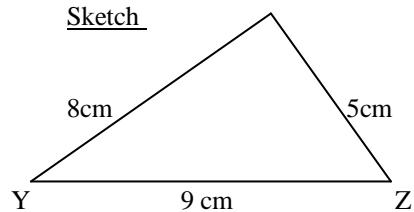
- Types of triangles
- Construction of triangles (SSB) using a pair of compasses And a protractor

#### Examples:

Construct triangle XYZ where the side XY = 8 cm. YZ = 9cm and

XZ = 4cm

Sketch



Accurate

**N.B** (Emphasize a sharp pencil and accuracy)

**Activity:**

A old MK BK 6 pages 288 – 291.

**Remarks**

**LESSON 5**

Subtopic: Construction of triangles

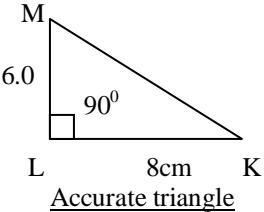
Content: Construct triangles involving an angle: (S A S, (SSA), (ASS)

N.B Emphasize the use of sharp pencil)

Example: Use pair of compasses, ruler and pencil only construct triangle KLM with angle  $KLM = 90^\circ$ , side  $LM = 6.0\text{cm}$  and  $KL = 8\text{ cm}$

(b) Measure (a)  $MK$  (b)  $\angle KML$

Sketch



Accurate triangle

$$\begin{aligned} KM &= 10 \text{ cm} \\ \angle KML &= 52^\circ \end{aligned}$$

**Activity**

Understanding mtc pg 230-231

**Remarks**

**LESSON 6**

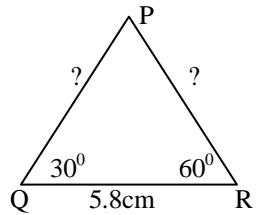
Subtopic: Construction of triangles

Content: Construct triangle (AAS)

**Example:** Construct triangle PQR where angle  $PQR = 30^\circ$ , angle  $PRQ = 60^\circ$  and side  $QR = 5.8\text{cm}$

(a) Measure PQ and PR (ii) Measure angle P

Sketch



Accurate

**Activity**

Understanding mtc pg 230-231

**Remarks**

**LESSON 7**

SUBTOPIC: Construction of polygons

Content: - Construction of quadrilaterals

(a) square

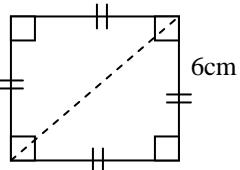
(b) Rectangle

(c) Determine the diagonals

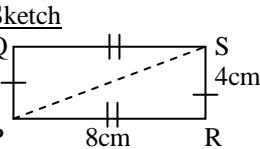
Their properties

Example: (i) Construct 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



- iii) construct a square in a circle

### Activity

The pupils will do exercise on construction of squares and rectangles:

Tr's collection

### Remarks

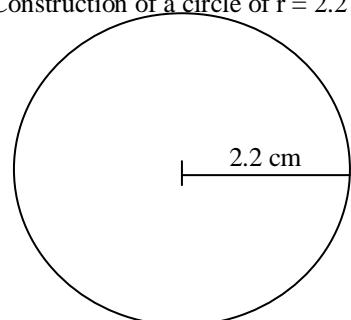
## LESSON 8

SUBTOPIC:  
Content:

construction of polygons  
A regular Hexagon in a circle

**N.B** Accuracy in measuring radii

- (i) Construction of a circle of  $r = 2.2$  cm



- (ii) Construct a regular hexagon of side 4cm

EMPHASIZE  
ACCURACY

- (b) Find its perimeter  
 $P = 6 \times \text{side}$   
 $= 6 \times 4 \text{ cm}$   
 $P = 24 \text{ cm}$

- Content: - Construction of regular hexagon from centre angles  
- Construction of a regular octagon

- Examples: A regular hexagon from centre angle.  
Centre  $\angle = \frac{360}{6} = 60^\circ$  (ii) regular octagon of side  
 $= 1.5 \text{ cm}$   
 $\frac{360}{8} = 45^\circ$

### Activity

Fountain pg 155-156

New mk 165

### Remarks

## LESSON 9

Subtopic:

Content: properties of triangles and quadrilaterals.

Properties of:

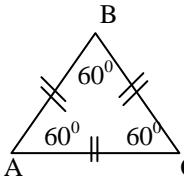
- (a) Triangles (Equilaterals, scalene, isosceles and right angled triangle)

- (b) square

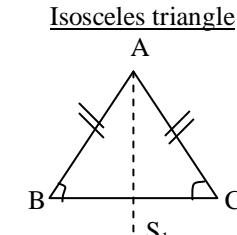
- (c) Rectangle

- (a) properties of triangles

Equilateral

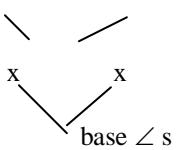
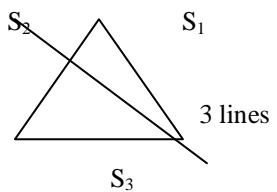


- (ii) Isosceles triangle

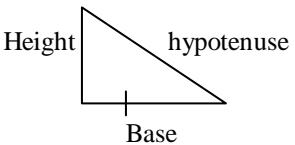


- 3 equal side  
 $AB = AC = BC$   
Each int  $\angle = 60^\circ$   
Has 3 lines of folding symmetry

- 2 equal sides ( $AB = AC$ )  
- one line of folding symmetry  
- 2 base  $\angle$ s are equal

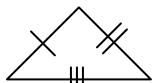


(iii) Right angled triangle



- one Int  $\angle = 90^\circ$  (right angle)
- longest side is Hypotenuse
- Int  $\angle$  sum =  $180^\circ$

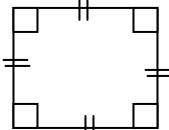
(iv) Scalene triangle



- Has all 3 sides not equal
- No line of symmetry
- Int  $\angle$  s add to  $180^\circ$

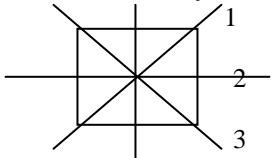
(b) Properties of quadrilaterals

(i) Square



- All 4 sides equal
- Each Int  $\angle = 90^\circ$
- Int  $\angle$  sum =  $360^\circ$

Has 4 line of symmetry



(ii) Rectangle



- 2 opposite sides are equal i.e ( $L_1 = L_2$ ) ( $W_1 = W_2$ )
- Each Int  $\angle = 90^\circ$

Has 2 lines of symmetry



4

### 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             |

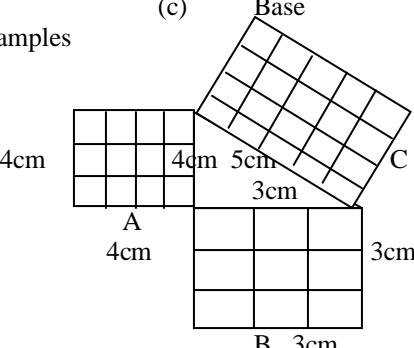
### LESSON 10

Subtopic: Pythagoras theorem

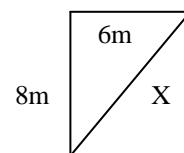
Content: Use the Pythagoras theorem to find

- |                |
|----------------|
| (a) Hypotenuse |
| (b) Height     |
| (c) Base       |

Examples

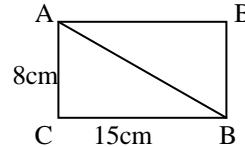


(ii) Find X



$$\begin{aligned} (6m)^2 + (8m)^2 &= x^2 \\ (6m \times 6m) + (8m \times 8m) &= X^2 \\ 36m^2 + 64m^2 &= X^2 \\ \sqrt{100m^2} &= \sqrt{X^2} \\ 10m &= x \end{aligned}$$

(iii) Find AB

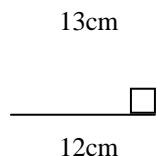


$$\begin{aligned} 15cm^2 + 7cm^2 &= AB^2 \\ 225cm^2 + 64cm^2 &= AB^2 \\ \sqrt{289cm^2} &= \sqrt{AB^2} \\ 17cm &= AB \end{aligned}$$

$$h^2 + 12cm^2 = 13cm^2$$

(iii) Find the height





$$\begin{aligned} h^2 + 144\text{cm}^2 &= 169\text{cm}^2 \\ h^2 + 144\text{cm}^2 - 144\text{cm}^2 &= \underline{- 144\text{cm}^2} \\ 25\text{cm}^2 & \\ \sqrt{h^2} &= \sqrt{25\text{cm}^2} \\ h &= 5\text{cm} \end{aligned}$$

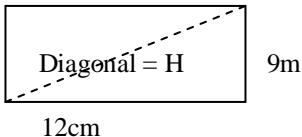
Activity

exercise 1 from Oxford primary MTC pupils Bk pages 150 – 151, and Exercise 12:30 MK BK 6 page 295 fountain pg 157

#### Remarks

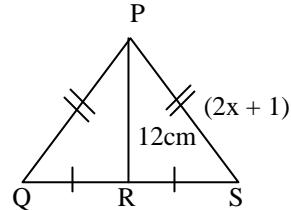
#### LESSON 11

- 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



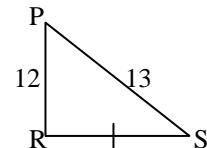
$$\begin{aligned} \text{Diagonal} = H \\ 12\text{m}^2 + 9\text{m}^2 &= H^2 \\ 144\text{m}^2 + 81\text{m}^2 &= H^2 \\ \sqrt{225\text{m}^2} &= \sqrt{H^2} \\ 15\text{m} &= H \\ \therefore \text{Diagonal} &= 15\text{ m} \end{aligned}$$

- (ii) The triangle below is Isosceles: PQ = 13cm



$$\begin{aligned} \text{Find } X \\ PS = PQ \\ (2x + 1) &= 13\text{cm} \\ 2x + 1 - 1 &= 13\text{cm} - 1 \\ 2x &= 12\text{ cm} \\ 2x &= 12\text{ cm} \end{aligned}$$

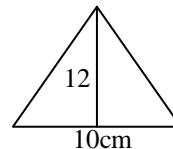
- (b) Find QS



$$\begin{aligned} RS^2 + RP^2 &= PS^2 \\ RS^2 + 12^2 &= 13^2 \\ RS^2 + 144 &= 169 \\ RS^2 + 144 - 144 &= 169 - 144 \\ RS &= \sqrt{25} \\ RS &= 5 \end{aligned}$$

$$\frac{2}{X} = \frac{2}{6\text{ cm}}$$

- (c) Find area of PQS



$$\begin{aligned} A &= \frac{1}{2} \times b \times h \\ (\frac{1}{2} \times 10 \times 12) \text{ cm}^2 & \\ \frac{1}{2} \times 5 \times 12 \text{ cm}^2 & \\ \text{Area} &= 60 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \therefore QS &= 5 \times 2 \\ &= 10\text{ cm} \end{aligned}$$

- (d) Work out perimeter  
 $P = QP + PS + QS$   
 $= 13\text{cm} + 13\text{cm} + 10\text{cm}$   
 $P = 36\text{ cm}$

#### Activity

Pupils will do exercise 12:34 page 300 MK pupils BK 6 pages 299 – 300

#### Remarks

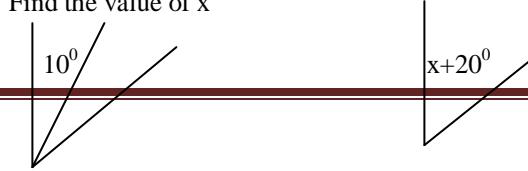
#### LESSON 12

- Subtopic: Angle properties  
 Content: - Acute, obtuse, reflex, straight, right and centre angles  
 - Complementary

- Example: (i) Describe the angles below

Angle	Description	Reason
$50^\circ$	Acute angle	It is $< 90^\circ > 0$
$124^\circ$	Obtuse angle	It is $> 90^\circ < 180^\circ$
$180^\circ$	Straight angle	It is a straight line
$280^\circ$	Reflex angle	$> 180^\circ$ but $< 360^\circ$
$360^\circ$	Centre angle	Forms full circle

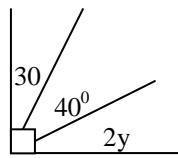
- (a) Find the value of x



$$50^{\circ}$$

$$\begin{aligned} 3x + 10^{\circ} + 50^{\circ} &= 90^{\circ} \\ (\text{complementary } \angle\text{s}) \\ 3x + 60^{\circ} &= 90^{\circ} \\ 3x + 60 - 60 &= 90 - 60 \\ \underline{3x} &= \underline{30} \\ 3 & 3 \\ X &= 10^{\circ} \end{aligned}$$

(b) If  $2y$ ,  $40^{\circ}$ , and  $30^{\circ}$  are complementary angles, find  $y$ .



$$\begin{aligned} x + 20 + 2x + 10 &= 90^{\circ} \\ x + 2x + 20 + 10 &= 90^{\circ} \\ 3x + 30^{\circ} &= 90^{\circ} \\ 3x + 30 - 30 &= 90 - 30 \\ \underline{3x} &= \underline{60} \\ 3 & 3 \\ X &= 20^{\circ} \\ 2y + 30^{\circ} + 40^{\circ} &= 90^{\circ} \\ 2y + 70^{\circ} &= 90^{\circ} \\ 2y + 70 - 70 &= 90 - 70 \\ \underline{2y} &= \underline{20} \\ 2 & 2 \\ Y &= 10 \end{aligned}$$

Find complement of  $(y-30^{\circ})$

Ref: fountain 146

MK new edition pg 144

Remarks

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### LESSON 13

Subtopic:

Supplementary angles

Content:

- Angles on a straight line
- Angles on a triangle

Examples:

$4f + 60^{\circ}$  What is f

$$4f + 60 = 180$$

(angles on a straight line add up to  $180^{\circ}$ )

$$4f + 60 = 180$$

$$2x+10^{\circ}$$

$$\begin{aligned} 4f &= 60 - 60 = 180 - 60 \\ 4f &= 120 \\ \frac{4f}{4} &= \frac{120}{4} \\ f &= 30^{\circ} \end{aligned}$$

(ii) If  $2y + 20^{\circ}$ ,  $y + 80^{\circ}$  and  $2y$  are supplementary  $\angle$ s  
Find y

$$2y + 200 + y + 800 + 2y = 180^{\circ}$$

$$2y + y + 2y + 20 + 80 = 180^{\circ}$$

$$5y + 100 = 180^{\circ}$$

$$5y + 100 - 100 = 180 - 100$$

$$\begin{array}{r} 5y \\ \hline 5 \\ y = 16^{\circ} \end{array}$$

(iii) Interior angles of a triangle add up to  $180^{\circ}$   
Find the unknown

(a)

(b)

$$2x + 50^{\circ} + 90^{\circ} = 180^{\circ}$$

(Int  $\angle$ s add up to  $180^{\circ}$ )

$$2x + 140^{\circ} = 180^{\circ}$$

$$2x + 140 - 140 = 180 - 140$$

$$2x = 40$$

$$\begin{array}{r} 2 \\ 2 \\ \hline X = 20^{\circ} \end{array}$$

If  $4p$ ,  $300$  and  $p$  are angles in a triangle.

Find the value of the unknown

$$p + 4p + 30 = 1800$$

$$5p + 300 = 1800$$

$$5p + 30 - 30 = 180 - 30$$

$$\begin{array}{r} 5p \\ \hline 5 \\ p = 30^{\circ} \end{array}$$

### 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

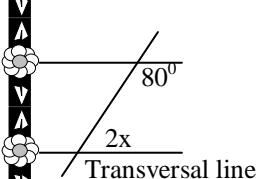
Remarks

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### LESSON 14

Subtopic:  
Content:  
Examples

Angles formed by the transverse  
The co-interior angles and co-exterior angles  
Find the unknown angles



$$\begin{aligned} 2x + 80 &= 180^{\circ} \\ (\text{co-int } \angle \text{s add to } 180) \\ 2x + 80 - 80 &= 180 - 80 \\ \underline{2x} &= \underline{100} \\ 2 & 2 \\ X &= 50^{\circ} \end{aligned}$$

#### 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

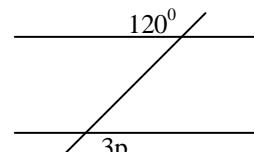
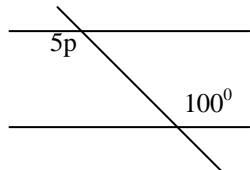
### LESSON 15

Subtopic:  
Content:-

- Alternate interior angles
- Alternate exterior angles
- (ARE EQUAL ANGLES)

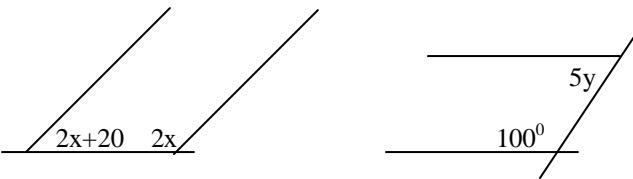
Examples:

Work out the unknown



Subtopic:  
Content:  
Examples

Angles formed by the transverse  
The co-interior angles and co-exterior angles  
Find the unknown angles



$$\begin{aligned} 2x + 20 &= 180^{\circ} \\ (co\text{-int } \angle \text{s add to } 180) \\ 2x + 20 - 20 &= 180 - 20 \\ 2x &= 160 \\ 2 & 4 \\ X &= 40^{\circ} \end{aligned}$$

$$\begin{aligned} 5y + 100 &= 180^{\circ} \\ 5y + 100 - 100 &= 180 - 100 \\ 5y &= 80 \\ 5 & 5 \\ Y &= 16^{\circ} \end{aligned}$$

$$\begin{aligned} 5p &= 1000 \\ (\text{Alt. int } \angle \text{s are equal}) \\ 5p &= 10^{\circ} \end{aligned}$$

$$\begin{aligned} 3p &= 120 \\ (\text{Alternate ext } \angle \text{s are } =) \\ \frac{3p}{3} &= \frac{120^{\circ}}{3} \\ P &= 40^{\circ} \end{aligned}$$

Subtopic:

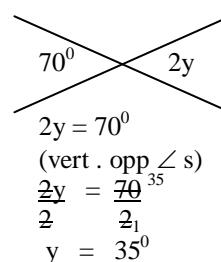
Content: Corresponding angles

- Vertically opposite angles
- corresponding angles

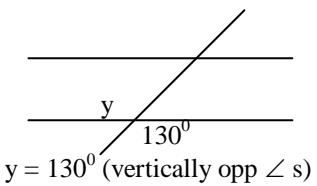
Examples

- (i) Find the unknown if the given angles are vertically opposites

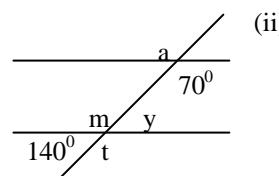
(a)



(b)



$$y = 130^{\circ} \text{ (vertically opp } \angle \text{s)}$$



$$\begin{aligned} a &= 70^{\circ} \text{ (vert opp)} \\ t &= 70^{\circ} \text{ (corresponding } \angle \text{s)} \\ a &= m \text{ (corresponding } \angle \text{s)} \\ \therefore m &= 70^{\circ} \\ Y &= 140^{\circ} \text{ (ver opp } \angle \text{s)} \end{aligned}$$

#### Activity

Pupils will do exercise 24:4 and 29:5 pages pg 267-273

#### Remarks

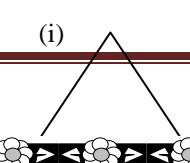
### LESSON 15

Subtopic:  
Content:

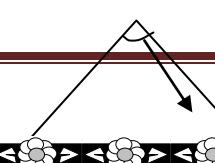
- Equal angles
- Base angles of Isosceles triangle
- 2 interior angle = 1 exterior angle

Example:

(i)

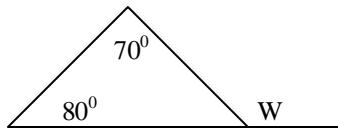


(ii)



$$\begin{array}{c} // \\ 2x \end{array} \quad \begin{array}{c} // \\ 60^\circ \end{array}$$

$$2x = 60 \\ (2 \text{ base } \angle \text{s of Isosceles } \Delta \text{ are } =) \\ 2x = 60^\circ \\ 2 \quad 2 \\ \underline{x = 30^\circ}$$



$$\begin{array}{c} \backslash \\ X \end{array} \quad | \quad 70^\circ$$

$$x + 70 + 70 = 180^\circ \\ x + 140^\circ = 180^\circ \\ x + 140 - 140 = 180 - 140 \\ \underline{x = 40^\circ}$$

$$80 + 70 = w \\ (2 \text{ int } \angle = 1 \text{ ext } + \text{opp } \angle) \\ 150^\circ = w \\ \underline{w = 150^\circ}$$

**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  $\angle$  is  $150^\circ$   
              Ext  $\angle$  + Int  $\angle = 180^\circ$   
              Let ext  $\angle$  be y  
 $y + 150^\circ = 180^\circ$   
 $y + 150 - 150 = 180 - 150$   
 $\underline{y = 30^\circ}$   
 (b) Work out the exterior angle of a regular decagon  
     Decagon = 10 sides  
     Ext  $\angle = \frac{360}{10} = \frac{360}{10} = 36^\circ$   
 $\therefore \underline{\text{Ext } \angle = 36^\circ}$

**Activity**

Exterior	Interior	Number of sides
X	$120^\circ$	_____
_____	_____	5 sides
$72^\circ$	_____	5 sides

140 <sup>0</sup>	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  
 $\text{Int angle sum} = (n-2) \times 180$   
 $= (6-2) \times 180^\circ$   
 $4 \times 180$   
 $\underline{\text{Int angle sum} = 720^\circ}$

- (ii) The interior angle of a regular polygon is five times the Exterior angle

(a) Find the ext $\angle$	(b) Find the int $\angle$
Let ext $\angle = x$	int $\angle = 5x$
Ext int	$5x = 5x$
$x = 5x$	$x = 300$
$6x = 180^\circ$	$5 \times 30 = 150^\circ$
$6 \quad 6$	
$\underline{x = 30^\circ}$	

(c) Find its interior angle sum  
 $\text{Int angle sum} = (n-2) \times 180$   
 $N = \frac{360}{30} = \frac{360}{30} = 12 \text{ sides}$   
 $1 \text{ ext } \angle$   
 $1 \text{ ext } \angle \text{ sum} = (12-2) \times 180^\circ$   
 $10 \times 180^\circ$   
 $\underline{= 1800^\circ}$

- 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:

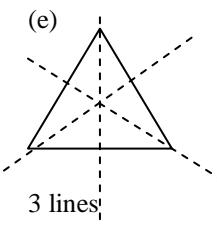
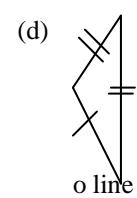
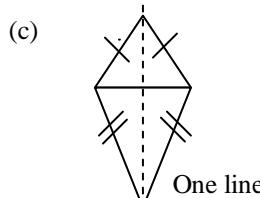
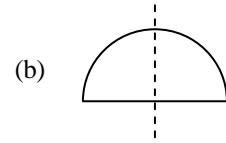
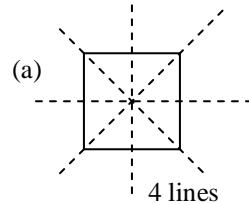
Symmetry

Content:

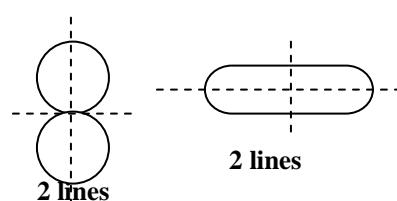
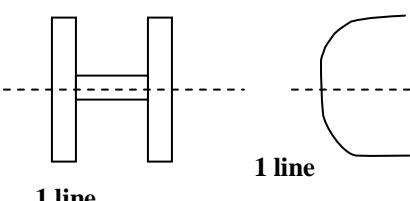
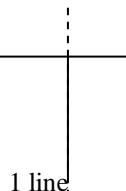
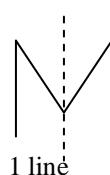
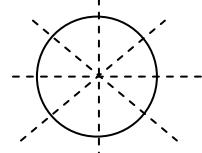
Lines of folding symmetry of plane shapes

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

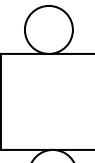
Content:

- Nets of solid objects

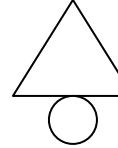
- Modes of solids

Example:

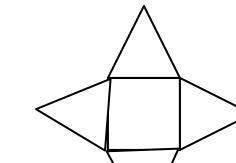
Name the solid whose net is drawn



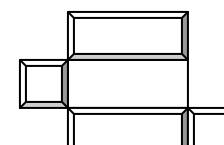
Cylinder



cone



sq-base prism



cuboid

### Activity

The pupils will draw sketch nets of

- (a) cylinders
- (b) cones
- (d) sq-based prism
- (e) pyramid
- (f) cube
- (g) cuboid

### Remarks

### LESSON 3

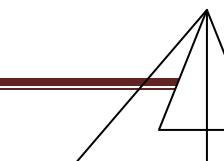
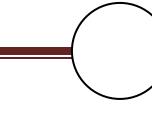
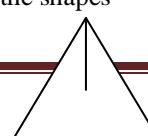
Subtopic: Properties of space objects and their nets

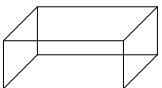
Content:

- Naming solid figures
- Drawing solid shapes.
- The edges, vertices, faces  
i.e edges + 2 = vertices + faces

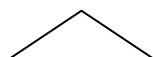
Examples:

Name the shapes



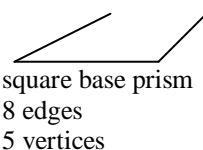


cuboid  
has: 12 edges  
8 vertices  
6 faces



tetrahedron  
6 edges  
4 vertices

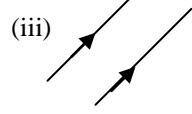
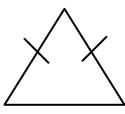
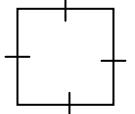
sphere



square base prism  
8 edges  
5 vertices

### REVISION QUESTIONS ON GEOMETRY

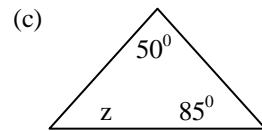
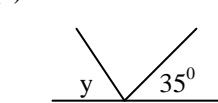
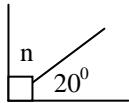
1. Name the following shapes



(iv)



2. Find the unknown angles below



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?



### Activity

Pupils will do exercise from Mk Bk 6.

### Remarks \_\_\_\_\_

4 faces

5 faces

$50^0$

$x+40$      $2(x+5)$

x

$120^0$

5. Use a pair of compasses, ruler and pencil to:

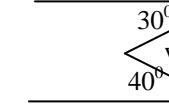
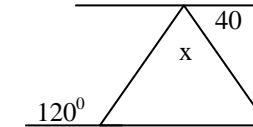
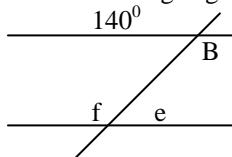
- (a) construct  $45^0$  (b)  $120^0$  (c)

Bisect the angle

- (d) Bisect line AB at point Y

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

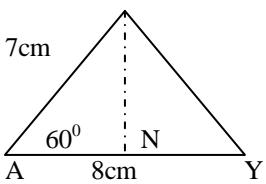
(c) Equilateral triangle (d) kite

Copy and construct the figure accurately. Drop the perpendicular line to meet AV at N from point T.

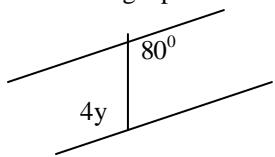
Sketch

Accurate figure

T

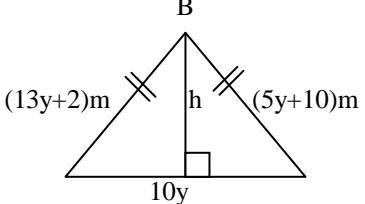


10. (b) Measure TN (c) Work out the area of ATY  
The interior angle of a regular polygon is thrice its exterior angle. Find its interior angle sum.
11. (i) Don faces NE and makes a clockwise turn to face SW. what is the measure of his turn?  
(ii) Draw the shapes: cylinder (b) cube  
(c) triangular 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,  $\angle XYZ = 60^\circ$  and  $ZXY = 45^\circ$   
(b) Measure XZ (c)  $\angle XZY$
13. Without using a pair of compasses construct angle  $50^\circ$



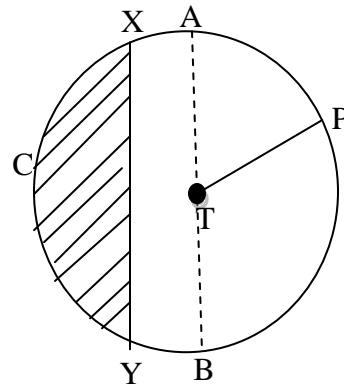
Find the value of y.

14. What acute angle is between the hour and minute arm of a clock at 6: 15 pm  
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
15. Calculate the length of a rectangle whose width is 7cm and a diagonal of 25 cm.  
(b) Find its (i) Area (ii) perimeter
16. 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

- Example: - Inverse property  
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)  
 $+ 6 - 6$

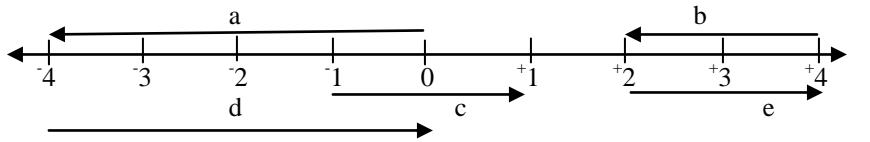
N.B An integer plus its opposite gives zero.  
i.e  ${}^{+}6 - 6 = 0$   
(b)  $-3t + 3t$   
Answer is 0

Subtopic: Represent Integers using arrow.

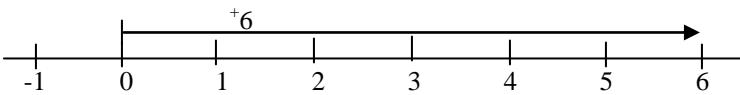
Content: - Name arrows on number lines

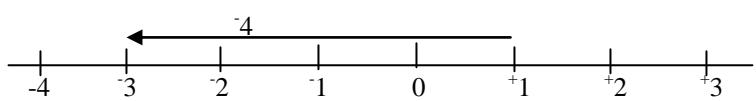
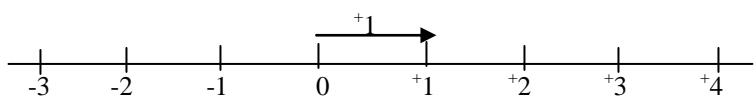
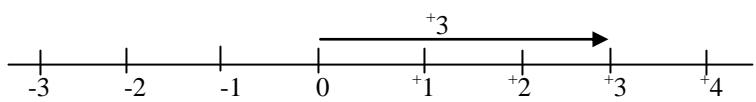
- Draw arrows to represent integers

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

**Use  $>$ ,  $<$  or  $=$  to compare**

(a)  $\begin{array}{r} +2 \text{ ----- } -2 \\ \underline{+2 > -2} \end{array}$

(b)  $\begin{array}{r} -20 \text{ ----- } +11 \\ \underline{-20 < +11} \end{array}$

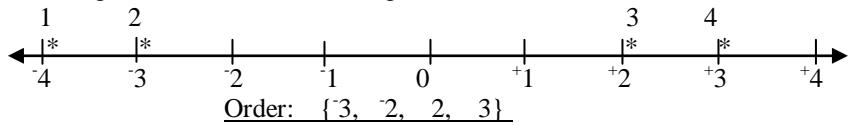
(c)  $\begin{array}{r} 0 \text{ ----- } -4 \\ \underline{0 > -4} \end{array}$

(d)  $\begin{array}{r} -100 \text{ ----- } 0 \\ \underline{-100 < 0} \end{array}$

(e)  $\begin{array}{r} -y \text{ --- } +y \\ < \end{array}$

(f)  $\begin{array}{r} 12 \text{ ----- } +12 \\ = \end{array}$

(ii) Arrange  $\{-2, 3, -3, 2\}$  in ascending order



- (iii) Put  $\{-12, -20, -34, 0, 6\}$  in descending order  
 $\begin{matrix} 3^{\text{rd}} \\ 4^{\text{th}} \\ 5^{\text{th}} \\ 2^{\text{nd}} \\ 1^{\text{st}} \end{matrix}$

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

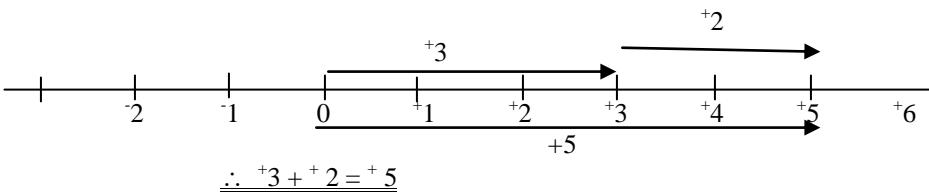
(ii) Positive and negative integers

(iii) Negative and negative integers

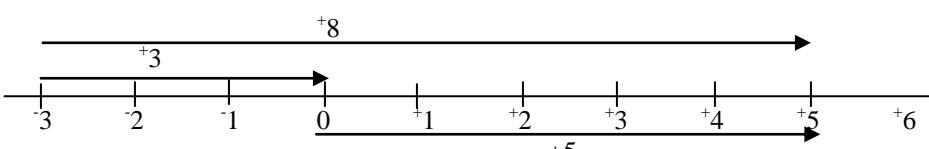
On a number line

- Write sentences of addition on number lines.

Examples: (a) Add  $+3 + +2$



(c)  $-3 + +8 =$



Operation on integers

Content: Addition of integers

Examples:	(i) Add: $+6 + -6$ (inverse) $+ 6 - 6$ $= 0$	(c) $+8 + -4$ means $+8 - 4 = +4$
	(b) $+5 + +2$ $= +7$	(d) $-12 + -16$ $= -28$
(ii)	$-2y + +2y$ Means $-2y + 2y$ $\underline{= 0}$	

### 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

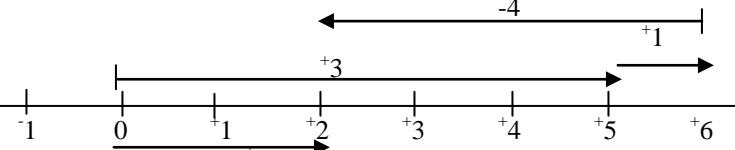
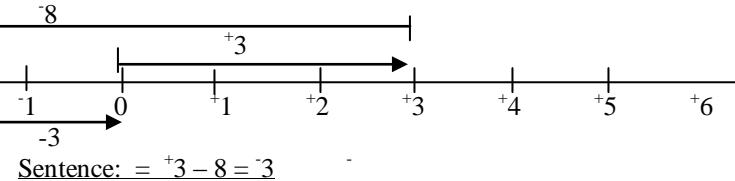
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### LESSON 4

Subtopic: Operations on integers

Content: Subtraction on number line

Example: (i) Write the subtraction sentences gives



S  
SUBTOPIC: Operations on integers

### Subtraction of integers:

Examples:	Work out: (Use the inverse of 2 <sup>nd</sup> integer in qn (ii))		
(a)	$7 - 5$ $\underline{= 12}$	(b) $+7 - +5$ means $+7 - 5$ $\underline{= 2}$	(c) $-7 - +5$ means $-7 - 5$ $\underline{= -12}$
(ii)	Evaluate		
(a)	$4 - -2$ Means $\underline{4}$	(b) $+7 - (-3)$ inverse is $+3$ $+7 + 3$ $\underline{= +10}$	(c) $-8 - (-10)$ inverse is $+10$ $-8 + 10$ $\underline{= 2}$

### 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

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### LESSON 5

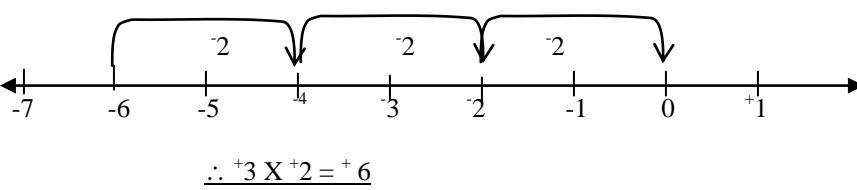
Subtopic: Operations on integers

Content: Multiplying integers on a number line

$$+ x + = + \quad + x - = - \quad - x + = + \quad - x - = -$$

Without a number line.

Example: (i) Show:  $+3 \times -2$  below (3 groups of 2)



### 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

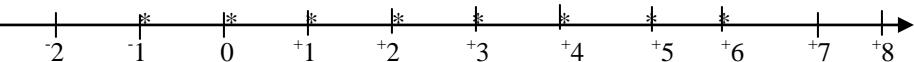
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## LESSON 6

Subtopic: Sets on a number line.

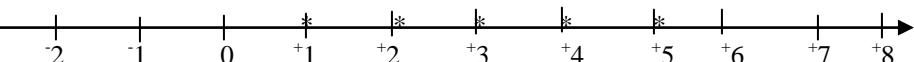
- Content:
- Interpreting sets of integers on a number line.
  - Representing sets of integers on a number line.

Examples: (i) Write the set  $y$  shown below.



$$\text{Set } Y = \{-1, 0, +1, +2, +3, +4, +5, +6, \dots\}$$

(ii) Find set  $P$



$$\text{Set } P = \{+1, +2, +3, +4, +5\}$$

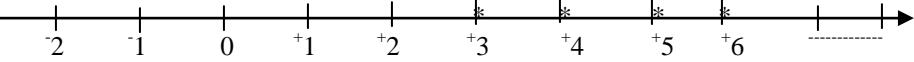
(iii) Find the set shown



Subtopic: Find the solution sets.

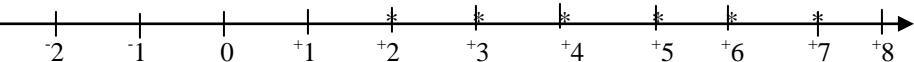
Content: Give the solution sets using a number line.

Examples: (i) If  $X > 2$  find possible values of  $X$



$$X = \{+3, +4, +5, +6, \dots\}$$

(ii) If  $X \geq 2$  find the solution set for  $X$ .



$$X = \{2, 3, 4, 5, 6, 7, \dots\}$$

## 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:  $\frac{2x}{2} > \frac{8}{2}$   
 $\underline{\underline{x > 8}}$

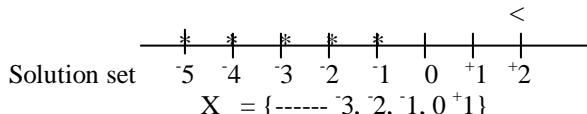
(b) Solve and give the solution set:

$$3x + 2 < 8$$

$$3x + 2 - 2 < 8 - 2$$

$$\frac{3x}{3} < \frac{6}{3}$$

$$\underline{\underline{x < 2}}$$

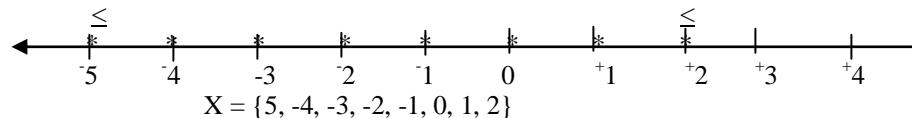


$$X = \{-----, -3, -2, -1, 0, +1\}$$

(c) Solve:  $-10 < 2x < -4$

$$\frac{-10}{2} < \frac{2x}{2} < \frac{-4}{2}$$

$$-5 < x < -2$$



$$X = \{-5, -4, -3, -2, -1, 0, 1, 2\}$$

Ref: old Mk pg 210

## REVISION WORK ON INTEGERS

1. Evaluate

(a)  $8 - 3$  (b)  $-9 - 6$   
(c) Decrease  $+7$  by  $-7$

Work out:

(a)  $-3 \times 0$  (b)  $0.8 \times (-4)$

Use a number line to add:

(a)  $-6 + 4$  (b)  $4 - +7$   
(c) Find the additive inverse of  $+6$ .  
(d) Add:  $-6 + 6$  (e)  $+14 - 14$

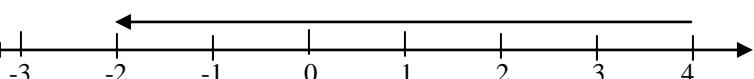
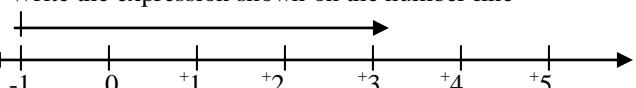
Work out:

(a)  $+8 - -8$  (b)  $-10 - +15$  (c)  $+9 \div +3$   
(d)  $-6 \times +2$  (e)  $-12 \div -3$

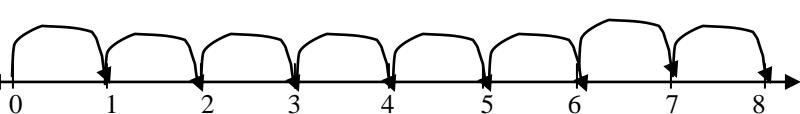
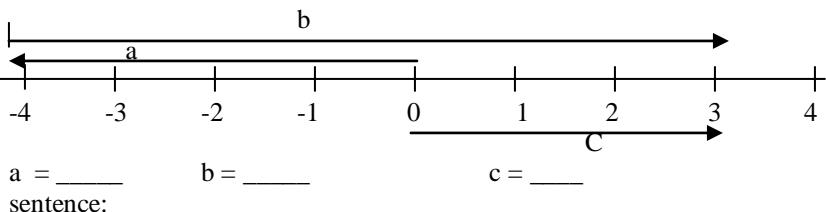
The temperature of ice fell from  $-3^{\circ}\text{C}$  by  $5^{\circ}\text{C}$ . Find the temperature of ice.

(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?

Write the expression shown on the number line



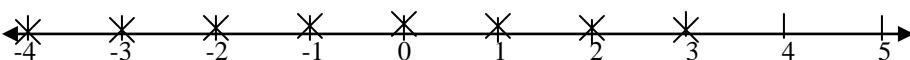
(c) Give the sentence shown



\_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

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  $30^{\circ}$  at noon. It drops by  $-10^{\circ}\text{C}$ . What is the new temperature?

- (d) Find  $r$  if  $(-2) + r = 0$   
9. (a) If  $X = \{\text{even numbers between } 10 \text{ and } 20\}$ . 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:  $\frac{2}{3}x - 6$  (b)  $-2(y + 1)$

- (c) Solve:  $3 \geq 3x \geq 9$  (d)  $-4p \leq -8$   
(a)  $+20 + -8$  (b)  $-8 + -20$  (c)  $+8 + +60$

11. 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)  $-20 \dots +8$  (ii)  $-2 \dots -10$   
(iii)  $+4 \dots -400$  (iv)  $0 \dots -1$

13.  $n - -3 = 3$  find the value of n.

(b) What is the sum of  $-3y$  and  $+7y$ ?

(c) Work out y: If  $y = \{\text{prime numbers less than } 10\}$

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
- (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

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## LESSON 2

Subtopic: Substitution

Content: 1. Expanding Algebraic terms

2. Substitution

Examples: (a) Expand the following

- 1.  $2p = 2 \times p$
- 2.  $3p q = 3 \times p \times q$
- 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  $b = 6$       (2) If  $p = 8, q = 6, a = 2$   
 Find:  $b + 8$                   what is  $pqa$   
 $6 + 8$                            $pqa = p \times q \times a$   
 $\underline{= 14}$                            $= 8 \times 6 \times 2$   
 $\underline{= 96}$

3. Given  $b = 6, c = -3, a = 2$

$$\text{Find } \frac{bc}{a} = \frac{b \times c}{a}$$

$$= \frac{6 \times -3}{2} = \frac{3 \times -3}{-9}$$

### Activity:

Pupils do exercises 14:6 and 14:7 from A New Mk Book 6 on page 376  
 New MK 180-181

### Remarks

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## LESSON 3

Sub topic: Like terms

Content: Collecting and simplifying the like terms

Examples: 1. Simplify:      2. Simplify:  $3x + 4x + 2x$

$$r + r + r + r$$

$$\underline{\underline{= 3r}}$$

$$7x + 2x$$

$$\underline{\underline{= 9x}}$$

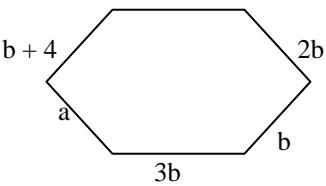
3.  $3h \times 3$   
 $3 \times h \times 3$   
 $\underline{\underline{= 9h}}$

4.  $3x^2 \times 4x^2$   
 $= 3 \times 4 \times x^3 \times x^3$   
 $\underline{\underline{= 12x^4}}$

5.  $x + y + 2x + 4y$   
 $X + 2x + y + 4y$   
 $\underline{\underline{3x + 5y}}$

6.  $3x + 6y - x - 2y$   
 $3x - x + 6y - 2y$   
 $\underline{\underline{2x + 4y}}$

a+b



$$\begin{aligned}
 & a + b + b + 4 + a + 3b + a + 2b \\
 & a + a + a + b + b + 3b + 2b + 4 \\
 & \underline{3a + 7b + 4}
 \end{aligned}$$

### **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

$$\begin{aligned}
 2(a + 3) &= (2 \times a) + (2 \times 3) \\
 &= \underline{2a + 6}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad \text{If } b = 1 \text{ and } c = -3 \\
 &\text{find: } 3b - c \\
 &= (3 \times b) - c \\
 &= (3 \times 1) - 3 \\
 &= \underline{3 - 3 = 0}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad -(2x - 2y) & 4. \quad \frac{1}{2}(8a + 4b) \\
 -2x (-2y) &= (\frac{1}{2} \times 8a) + (\frac{1}{2} \times 4b) \\
 &= \underline{-2x + 2y} \\
 &= \underline{4a + 2b}
 \end{aligned}$$

$$\begin{aligned}
 5. \quad 3(x + 3) - 2(x - 1) & \\
 3x + 9 - 2x + 2 & \\
 3x - 2x + 9 + 2 = & \\
 & \underline{x + 11}
 \end{aligned}$$

### **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.

$$\begin{aligned}
 1. \quad p + 4 &= 12 \\
 p + 4 - 4 &= 12 - 4 \\
 p &= \underline{8}
 \end{aligned}$$

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

$$\begin{aligned}
 p + 6 &= 11 & \text{She had 5 pineapples} \\
 p + 6 - 6 &= 11 - 6 \\
 p &= \underline{5}.
 \end{aligned}$$

### **Finding the unknown.**

Forming and solving equations involving subtraction.

$$\begin{aligned}
 \text{Examples: } 1. \quad \text{Find the value of:} \\
 b - 3 &= 8 \\
 b - 3 + 3 &= 8 + 3 \\
 \therefore b &= \underline{11}
 \end{aligned}$$

### **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:  
Examples:

Forming and solving equations involving multiplication

1. Solve:  $2x = 8$

$$\begin{array}{rcl} 2x & = & 8 \\ \underline{2} & & \underline{2} \\ x & = & 4 \end{array}$$

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  $\times$  passengers)
- $$\begin{array}{rcl} 4 \times y & = & 320 \text{ passengers} \\ 4y & = & 320 \\ \underline{4} & & \underline{4} \\ y & = & 80 \end{array}$$
- Each bus carried 80 passengers.

Content:  
Examples:

Collect like terms and simplify.

1.  $3g + g + 2g = 30$

$$\begin{array}{rcl} 6g & = & 30 \\ 6 & & 6 \\ g & = & 5 \end{array}$$

Activity:  
Examples:

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

$$\begin{array}{l} x + 2x = 18 \\ 3x = 18 \end{array}$$

Anna's age is 6 years.

$$\begin{array}{rcl} 3 & & 3 \\ X & = & 6 \end{array}$$

**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)  $\frac{a}{3} = 4$

$$\begin{array}{rcl} \frac{a}{3} & = & 4 \\ 3 \times \frac{a}{3} & = & 4 \times 3 \\ a & = & 12 \end{array}$$

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  $p$

$$\begin{array}{rcl} \text{So } \frac{p}{5} = 6 & & \frac{5}{5} \times \frac{p}{5} = \frac{6}{5} \times 5 \\ p & = & 30 \end{array}$$

$P = 30$  oranges

3. Solve:  $\frac{5p}{4} + 2 = 12$

$$\begin{array}{rcl} \frac{5p}{4} + 2 - 2 & = & 12 - 2 \\ 4 \times \frac{5p}{4} & = & 10 \times 4 \\ 5p & = & 40 \\ \underline{5} & & \underline{5} \\ p & = & 8 \end{array}$$

**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.

$$L + W + L + W = \text{perimeter}$$

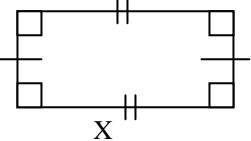
$$X + 4 + x + 4 = 24 \text{ cm}$$

$$X + x + 4 + 4 = 24 \text{ cm}$$

$$2x + 8 - 8 = 24 - 8$$

$$\frac{2x}{2} = \frac{16}{2}$$

$$\underline{\underline{X = 8 \text{ cm}}}$$



**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:  $3(y + 4) = 21$   
 $(3xy) + (3 \times 4) = 21$   
 $3y + 12 = 21$   
 $3y + 12 - 12 = 21 - 12$   
 $3y = 9$   
 $3 = 3$   
 $\underline{\underline{Y = 3}}$

2. Solve:  $5(y + 1) - 3(y - 1) = 14$   
 $(5xy) + (5 \times 1) - (3xy) - (-3 \times 1) = 14$   
 $(5y + 5) - (3y - 3) = 14$   
 $5y + 5 - 3y + 3 = 14$   
 $5y - 3y + 5 + 3 = 14$   
 $2y + 8 = 14$   
 $2y + 8 - 8 = 14 - 8$   
 $\frac{2y}{2} = \frac{6}{2}$

Y = 3

**Activity:**

Pupils will do exercises 14:33 and 14:34 on pages 392 and 393 from A New Mk Bk 6.

**Remarks.**

### LESSON 11

Subtopic: Application of Algebra  
 Content: Forming equations and finding the unknown.

Examples:

1.

$$2x - 1 = x + 3$$

$$2x - 1 + 1 = x + 3 + 1$$

$$2x = x + 4$$

$$2x - x = x - x + 4$$

$$\underline{\underline{X = 4\text{cm}}}$$

2.

$$2t = 8$$

$$\frac{2t}{2} = \frac{8}{2}$$

$$\underline{\underline{t = 4\text{cm}}}$$

**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)  $+3x(y - 1)$

5. (c)  $4(x + 3) + 2(x + 3)$

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?

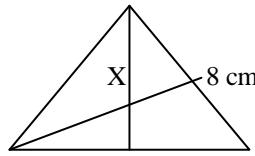
8. A father is 3 times as old as his daughter. Their total age is 48 years. How old is the daughter?

9. The perimeter of the square of side p cm is 28cm, Find P.

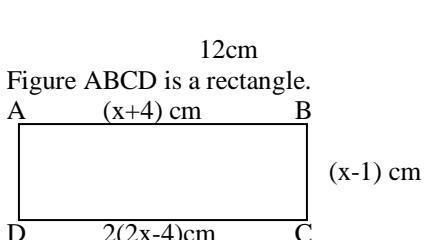
10. Solve:  $\frac{5p}{4} = 2 = 12$

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 \_\_\_\_\_

