DREAM AFRICA SCHOOLS

MTC LESSON NOTES

FOR TERM I, 2019

P.4.

SETS

Review of types of sets.

A set is a collection of well defined members or elements.

TYPES OF SETS (Review)

1. Empty set or null set.
   This is a set without any members.

   Symbol: $\{\ \ \}$ or Φ

   e.g. Pupils in a class without heads.

   _____

2. Equivalent sets
   These are sets with the same number of members but the members may be different.

   Symbol: $\Leftrightarrow$
   e.g. A = $\{b, c, d, e\}$ B = $\{0, 1, 2, 3\}$

   set A is equivalent to set B
   A $\Leftrightarrow$ B
          N.B. <≠> means "not equivalent to"

3. Equal sets
   These are sets with the same number of members which are exactly the same.

   Symbol: =

   e.g. K = $\{a, b, c, c\}$ L = $\{b, a, c\}$

   Set K is equal to set L because they have the same number and the same members.

      K = L
   _____

4. Disjoint sets
   These are sets without any common members.
   e.g.   M   = $\{6, 7, 8\}$

            N   = $\{2, 3, 4, 5\}$

   Set M and set N don't have any common members.

   REF: Primary MTC Bk 4 pg 1
        -   Understanding MTC bk 4 pg 1
        -   Primary MTC Bk 4 pg 9
        -   Primary school MTC bk 4 pg 1

UNION, INTERSECTION AND NUMBER OF MEMBERS

UNION SETS (Review)

This is a set which contains all the members in the given sets.

N.B. Common members are written once.

Symbol: ∪

e.g. Set   P = { a, e, , o, u }
            Q = { 2, 4, 6, 8 }

Set P ∪ Q   = { a, e, , o, u, 2, 4, 6, 8 }

INTERSECTION SET (Review)

This a set with the common members of the given set.

Symbol: "∩"

e.g.   P = { 1, 2, 3, 4, 5 }
       B = { 0, 1, 3, 4, 5}

Find:
   a) P ∩ B = { 2, 3, 4, 5}

   b) P ∪ B = { 0, 1, 2, 3, 4, 5}

---

5. A = {Banana, Orange}
    B = {Apple, Orange}

Find:
   a) A ∩ B = { Orange}

   b) A ∪ B = { Banana, Orange, Apple }

NUMBER OF MEMBERS (Review)

Symbol: n( )

Examples
1. P = { a, b, c}
    How many members are in set P.

    n(P) = 3 members.

---

2. M = { days of the week }
    Find n(M)

    M = {Mon, Tue, Wed, Thur, Fri, Sat, Sub}

    Find: n(M) =   7
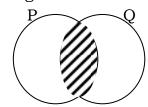

    REF: -   Understanding
            -   Primary MTC bk 4 pg 14 – 15
            -   Kenya Primary MTC Bk 4 4 pg 15 – 16

VENN DIAGRAM (Review)

Representing information on a Venn diagram:

Members   Members of
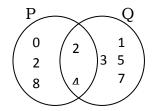Of Set P   P∩Q   Set Q only
only

Example:
Given   P =   {0, 2, 4, 6, 8}
            P =   {1, 2, 3, 4, 5, 78}

Find: P∩Q   =   { 2, 4}
      A ∪ B =   {0, 1, 2, 3, 4, 5, 6, 7, 8 }

Represent the sets on a Venn diagram.

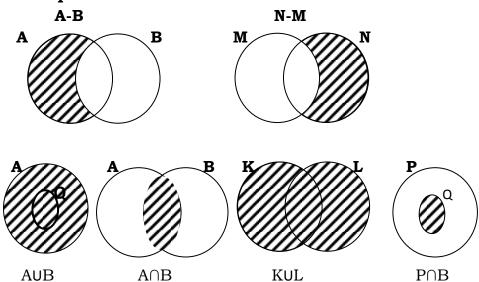REF: MK bk 5 Pg 12
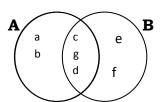   Primary MTC for Uganda bk 4
      Pg 60 – 62
      MK Bk 4 Pg 11 – 14

Shading Venn Diagrams (Review)

Example:

A-B

N-M

AUB   A∩B   KUL   P∩B

Getting information from a Venn Diagram (Review)

List down all members of Set;

A = { a, b, c, d, g}

B = { c, g, d, e, f}

A∩B = {c, d, g}

A ∪ B = { a, b, c, d, g, e, f }

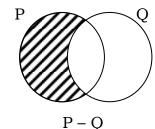n(A∩B) =   3 members
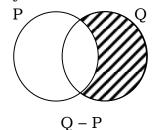
REF: MK Bk 5 pg 7
       MK Bk 4 pgs 11 – 14

Difference of sets (Review)

P – Q means members of set P which are not in Set Q, that is, members found in Set P only.

P – Q   Q – P

Example:
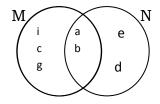
Given :   P =   {2, 3, 4, 6, 8, 9}

               Q =   {1. 2, 5, 6, 7, 10}

Find: P – Q = { 3, 4, 8, 9 }

               Q – P = 1, 5, 7, 10}

Example II

Find: M – N = {i, c, g}

N-M   = { d, e}

SUBSETS

A subset is a small set got from the main set.

Symbol: "C"

"¢" means not a subset of.

Example:

Given;   E = {all pupils in P.4}
            K = { all boys in P.4}
            B = {all girls in P.4}

Set B and set K are subsets of set E

Example

If: D   =   {1, 2, 3, 4}
        T   =   {2, 4}
        S   =   {1, 3}
        K   =   {5, 6}

T is a subset of D

(T C D)

S is a subset of D
(S C D)

K is not a subset of D
(K ¢ D)

Given: B = {s,t,v}   Form subsets from set B

{ s }, { t }, { v }, { s, t}, {t, v }, {s, v}, {s, t, v}, {}

N.B.   - An empty set is a subset of the main set.
          - A set itself is a subset of that set.

Using a Venn diagram to represent a subset

Using a Venn diagram to represent subsets.
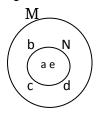
Set P is a subset of set Q

P ⊂ Q

Given: M = {a, b, c, d, e}
          N = {a, e}
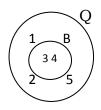
Represent the sets on a Venn diagram.

Find: M∩N   =   { a, e}

          M∪N   =   { a, b, c, d, e }

          n(M∪N) 5 Members

What is the relationship between P and B?

B is a subset of P

Find: P∩B   =   {3, 4}

REF: MK Bk 4 pg 17 (old edition)
          MK Bk 4 pg 17 (new edition)
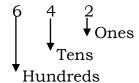
NUMERACY
Whole Numbers

Place value and value of whole numbers (Review)

Numeral	Hundred Thousands	Ten thousands	Thousands	Hundreds	Tens	Ones
7041			7	0	4	1
24,678		2	4	6	7	8
132,407	1	3	2	4	0	7
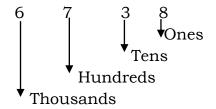
Finding the place value of the given digits.

What is the place value of 4 in 642?

6   4   2
→Ones
→Tens
→Hundreds

:. The place value of 4 is Tens.

_____

Find the place value of each digit in 6738.

6   7   3   8
→Ones
→Tens
→Hundreds
→Thousands

:. The place value of 6 is Thousands

The place value of 7 is Hundreds

The place value of 3 is Tens

The place value of 8 is Ones

_____

REF: - Primary School MTC Bk 4 pg 8
- Learning MTC Bk 4 pg 5
- MK Bk 4 pg 20 (Old edition)
_____

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Value of wholes(Review)

Value =   digit x place value

Find the value of each of the digits in 672

H   T   O
6   7   2
        ↓ 2 x 1   =   2
      ↘ 7 x 10   =   70
  ↘ 6 x 100   =   600

_____

Find the value of 0 in 6042

6   0   4   2

        ↓
      ↘ 0 x 100   =   0

_____

What is the value of 2 in 432?

H   T   O
4   3   2
        ↓ 2 x 1   =   2

_____

REF: MK Bk 4 pg 20
      Learning MTC Bk 4 pg 6
      Primary Science MTC Bk 4 pg 8

Application of values and place values
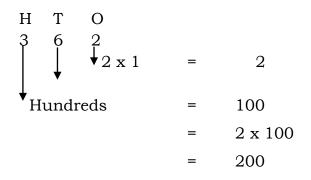
Example:

Find the sum of the value of 2 and 3 in the number 623.

H   T   O
6   2   3
        ↓ 3 x 1   =   3
      ↘ 2 x 10   =   + 2 0
                               2 3

_____

What is the sum of the place value of 6 and 2 in the number 632?

H   T   O
6   3   2
        ↓ Ones   =   1
  ↘ Hundreds   =   + 100
                              101

_____

Find the product of the value of 2 and place value of 3 in 362.

```
H   T   O
3   6   2
            2 x 1      =        2

    Hundreds           =      100

                       =      2 x 100

                       =      200
```

The place value of 2 is tens. What is its value.

```
Value    =    Digit x Place value
         =    2 x 10
         =    20
```

Writing whole numbers in words(Review)-up to thousands

1. Write 6438 in words.

Thousands	Hundreds	Units
6	4	38

6438 → Six thousand four hundred thirty eight.

2. Write 14,008 in words

Thousands	Hundreds	Units
14	0	08

14,008→ Fourteen thousand eight.

3. Express 240,402 in words

Thousands	Hundreds	Units
240	4	02

240,402 → Two hundred forty thousand four hundred two.

REF: MK Bk 4 pg 22
      Learning MTC Bk 4 pg 6
      Understanding MTC Bk 4 pg 11

Writing in figures(Review)

Write "three thousand six hundred in figures".

Three thousand 3000
Six hundred   +600
                3600

___

Write in figures; "Sixty thousand five hundred twenty.

Sixty thousand   60000
Five hundred   500
Twenty   + 20
                 60,520

___

REF: Understanding MTC bk 4 pg 13
Primary School MTC BK 4 PG 8
Learning MTC bk 4 pg 6
MK Bk 4 pg 23

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Writing numerals in expanded form(Review)

Expand 3485 using place values

$3485 = (3 \times 1000) + (4 \times 100) + (8 \times 10) + (5 \times 1)$

Expand 3485 using values
$3485 = 3000 + 400 + 80 + 5$

Expand: 46,246
$46,246 = 40,000 + 6000 + 200 + 40 + 5$

___

REF: - MK Bk 4 pg 23
      - Learning MTC Bk 4 pg 6
      - Understanding MTC Bk 4 pg 14

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Writing the expanded numbers in short. (Review)

Find the number which has been expanded to get;
1. $4000 \times 200 \times 40 \times 7$

        4 0 0 0
          2 0 0
            4 0
        +   7
        4 3 4 7

2. (5 x 100) + (6 x 1000)+ (4 x 1)

   500 + 6000 + 4

    6 0 0 0

     5 0 0

  +   4
   _____
   6 5 0 4

3. (9 x 10000) + (4 x 1000) + (7 x 10)

   90000   +   4000 +   70

    9 0 0 0 0

     4 0 0 0

  +   7 0
   _____
   9 4 0 7 0

REF: - Learning MTC Bk 4 pg 6

       - Understanding MTC bk 4 pg 4

ROMAN NUMBERALS (Review) – up to one hundred.

Basic Roman Numerals are;

1 = I   50 = L   1000 = M

5 = V   100 = C

10 = X   500 = D

Roman numerals from 1 to 1000

Hindu Arabic	Roman numeral		Hindu Arabic	Roman numeral
1	I		8	VIII
2	II		9	IX
3	III		10	X
4	IV		50	L
5	V		100	C
6	VI		500	D
7	VII		1000	M

Roman numerals got by repeating 1 and X;

Examples: 2   =   1 + 1   =   II

               3   =   1 + 1 + 1 =   III

               20   =   10 + 10   =   XX

               30   =   10+10+10 =   XXX

               300 =   100+100+100= CCC

Roman numerals got by adding.

6   =   5 + 1   7   =   5 + 2

    =   V + I   =   V + II

    =   VI   =   VII

60	=	50 + 10	700	=	500 + 200
	=	L + X		=	D + CC
	=	LX		=	DCC

Roman numerals got by subtracting from 5, 50, 100, 500 and 1000:

4   =   (1 subtracted from 5)
      =   IV

40   =   (10 subtracted from 50)
      =   XL

90   =   (10 subtracted from 100)
      =   XC

400   =   (100 subtracted from 500)
      =   CD

900   =   (100 subtracted from 1000)
      =   CM

REF: MK Bk 4 pg 32
      Primary MTC for Uganda Bk 4 pg 14-17

Expressing Roman numerals into Hindu Arabic numbers.

Convert the following to Hindu Arabic numerals:

1. XIV   =   X + IV
      =   10 + 4
      =   <u>14</u>

2. XXXIX   =   XXX + IX
      =   30 + 9
      =   <u>39</u>

3. XLV   =   XL + V
      =   40 + 5
      =   <u>45</u>

4. XCVIII   =   XC + VIII
      =   90 + 8
      =   98

5. DCCVII   =   DCC + VII
      =   700 + 7
      =   707

REF: - MK Bk 4 pg 34
      - Primary MTC for Uganda Bk 4 pg 17

Topical questions: **MK Bk 4 pg 35**

OPERATION ON NUMBERS

Addition:
Words used in addition include; Sum, Total, Increase, Altogether, Add, e.t.c.

Examples:
1. Find the sum of;

   a) $\begin{array}{r} 7\,4\,6\,4 \\ +\,4\,4\,2\,5 \\ \hline \mathbf{11\,8\,8\,9} \end{array}$ b) $\begin{array}{r} 1\,4\,6\,7\,0\,8 \\ +\;\;5\,2\,6\,1\,4 \\ \hline \mathbf{1\,9\,9\,3\,2\,2} \end{array}$

2. There are 469 goats, 943 cows and 6401 chicken on the farm. How many animals are there altogether?

   $\begin{array}{r} 4\,6\,9 \\ 9\,4\,3 \\ +\,6\,4\,0\,1 \\ \hline \mathbf{7\,8\,1\,3} \end{array}$

:.   There are 7813 animals altogether.

REF: - Primary MTC for Uganda Bk 4 pg 23
- MK Bk 4 pg 38
- Primary School MTC bk 4 pg 14

Subtraction of wholes

Words used include; **Reduce, Decrease, Difference, e.t.c.**
1. Subtract:

   a) $\begin{array}{r} 8\,4\,3\,2 \\ -\;4\,7\,3\,2 \\ \hline \mathbf{3\,7\,0\,0} \end{array}$ b) $\begin{array}{r} 5\,3\,2\,8\,6\,7 \\ -\,3\,1\,4\,6\,5\,8 \\ \hline \mathbf{2\,1\,8\,2\,0\,9} \end{array}$

2. Subtract 94 from 342.

   $\begin{array}{r} 3\,4\,2 \\ -\;\;\;9\,4 \\ \hline \mathbf{2\,4\,8} \end{array}$

3. What is the difference of 143 and 36?

   $\begin{array}{r} 1\,4\,3 \\ -\;\;\;3\,6 \\ \hline \mathbf{1\,0\,7} \end{array}$

4. Okot had Shs. 630. He bought a toy car for Shs. 560. How much money remained?

   $\begin{array}{r} \text{Sh.}\;\;\;6\,3\,0 \\ -\;\text{Sh.}\;\;\;5\,6\,0 \\ \hline \mathbf{Sh.\;\;\;0\,7\,0} \end{array}$

REF: -   Primary MTC Bk 4 pg 30
- Primary MTC for Uganda bk 4 pg 20-32
- Understanding MTC Bk 4 pg 18-25

Multiplication of wholes.

Multiplying of a 3/2 digit number by 1 digit number.

```
1.      1 3        2.       4 3        3.      1 2 0
      x     2            x     4              x     5
        2 6              1 7 2              6 0 0
```

REF: Primary MTC for Uganda bk 4 pg 36
      MK Bk 4 pg 46

Multiplying numbers by 10 and 20.

```
2.      4 2        2.       5 4        3.      3 2
      x 1  0            x 1 0              x 2 0
        4 2 0            5 4 0              6 4 0
```

REF: MK bk 4 pg 50

Multiplying 2-digit numbers by 2 digit numbers

```
1.      1 3        OR;          1 3
      x   1 2                   1 2   →  10 + 2
        0 2 6                   (13 x 10) + (13 x 2)
        1 3 0                   30    +    26
        1 5 6                   1 3 0
                                + 2 6
                                1 5 6
```
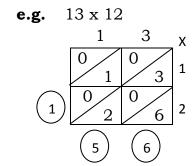
```
2.   4 5                        4 5
    x 1  2                     x 1  2   →    10 + 2
    0 9  0                     45 x 10    4 5 0
    4 5  0                     45 x 2     + 9 0
    5 4 0                                 5 4 0
```

Multiplying using lattice method:

e.g.   13 x 12
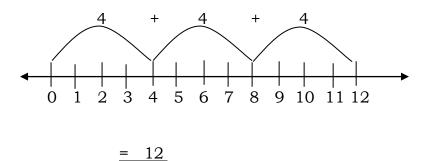

    =   156

REF: Primary MTC for Uganda bk 4 pg 40
      MK Bk 4 pg 50
      Understanding MTC BK 4 pg 26-30
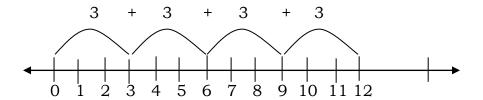
MULTIPLICATION OF NUMBERS ON A NUMBERLINE

E.g.

1. 3 x 4


```
    4       +      4      +      4
```

= 12

2. 4 x 3


```
  3    +    3    +    3    +    3
```

=   12

Divisions of 3 digit numbers by one digit

Use of long division

Exp: 1   4 6 8 ÷ 2

```
              2 3 4          x │ 2
          2 │ 4 6 8          0 │ 0
   2 x 2=4                   1 │ 2
            0 6              2 │ 4
   2x3=  0 6                 3 │ 6
           0 8              4 │ 8
   4x2=     0 8             5 │ 10
            0 0             6 │ 12
                           7 │ 14
                           8 │ 16
                           9 │ 18
```

Exp: 2   Share 570/= among 5 girls

```
              1 1 4          x │ 2
          5 │ 5 7 0          0 │ 0
   1 x 5=5                   1 │ 5
            0 7              2 │ 10
   1x5=   0 5               3 │ 15
            2 0             4 │ 20
   4x5=     2 0             5 │ 25
            0 0             6 │ 30
                           7 │ 35
                           8 │ 40
                           9 │ 45
```

=   114

DIVISIBILITY TEST

Divisibility test of 2:

A number is divisible by 2 when the last digit is even.

e.g.   50, 22, 94,108, etc.

Divisibility test of 3:

A number is divisible by 3 when the sum of digits is divisible by 3.

e.g.   a) 21   b)   144

$$= \quad 2 + 1 \qquad\qquad = \quad 1 + 4 + 4$$

$$= \quad 3 \qquad\qquad\qquad = \quad 9$$

$$= \quad 3 \div 3 \qquad\qquad = \quad 9 \div 3$$

$$= \quad \underline{1} \qquad\qquad\qquad = \quad \underline{3}$$

Divisibility test of 5:

A number is divisible by 5 when the last digit is 5 or 0.

e.g.   95, 240,

INTRODUCTION OF COMBINED OPERATIONS

Use BODMAS

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

Exp.   1.   Work out: $4 + 1 - 2$
$$= \quad (4 + 1) - 2$$
$$= \quad 5 - 2$$
$$= \quad \underline{3}$$

2.   Simplify: $4 + 2 + 5$
$$= \quad 4 + (2 \times 5)$$
$$= \quad 4 + 10$$
$$= \quad \underline{14}$$

Properties of zero:

1. $0 \times 0 \quad = \quad 0$

2. Zero multiplied by any number gives 0.

    i.e. $0 \times 25 \quad = \quad 0 \qquad\qquad k \times 0 = 0$

    $7 \times 0 \quad = \quad 0$

3. Zero added to any number gives the number to itself.

   i.e. $0 + 40$ = 40

            $8 + 0$ = 8

4. Any number to the power of zero gives one.

   i.e. 4^0 = 1

            100^0 = 1

5. Zero divided by any number gives zero.

   i.e. $0 \div 5$ = 0

            $\dfrac{0}{21}$ = 0

Properties of one:

1. Any number multiplied by one give the number itself.

   i.e. 1×20 = 20

            $y \times 1$ = y

            0×1 = 0

2. Any number divided by one except zero gives the same number.

   i.e. $\dfrac{4}{1}$ = 1

            $y \div 1 =$ y

Magic square:

Identify the sum or magic number.

Exp. Given the magic square below, find the values of the letters.

6	a	8
b	5	c
2	d	4

Magic number   = $2 + 5 + 8$

                 = 15

            a   = $15 - (8 + 6)$

                 = $15 - 14$

                 = 1

ARRANGING NUMBERS IN ASCENDING OR DESCENDING ORDER.

Ascending order (from small to big)

1. 10, 25, 8, 125
   8, 10, 25, 125

2. 75, 38, 146, 238
   38, 75, 146, 238

Descending order (from big to small)

1. 68, 29, 180, 140
   180, 140, 68, 28

2. 758, 587, 857, 875
   875, 857, 758, 587

FORMING NUMBERS FROM GIVEN DIGITS UP TO THOUSANDS

Examples:

1. 1, 3, 2
   123, 132, 213, 231, 312, 321

2. 2, 5, 1, 4:
   Find the smallest and highest number formed.

   1245, 1254, 1425, 1452, 1524, 1542, 5421,

   The smallest is 1245

   The highest is 5421

Estimating numbers

Examples to tens:

1. 23   ≈   20
2. 46   ≈   50
3. 125   ≈   130

Examples to hundreds:

1. 142   ≈   100
2. 361   ≈   400

N.B. Use a number line.

Rounding off:

1. Round off to the nearest tens:

    a) 47

$$\begin{array}{cc} T & O \\ 4 & \not{7} \\ + \; 1 & 0 \\ \hline 5 & 0 \end{array}$$
        $47 \approx 50$

    b) 63

$$\begin{array}{cc} T & O \\ 6 & \not{3} \\ + \; 0 & 0 \\ \hline 6 & 0 \end{array}$$
        $63 \approx 60$

2. Round off to the nearest hundreds.

    a) 349

$$\begin{array}{ccc} H & T & O \\ 3 & \not{4} & \not{9} \\ + \; 0 & 0 & 0 \\ \hline 3 & 0 & 0 \end{array}$$
        $349 \approx 300$

    b) 473

$$\begin{array}{ccc} H & T & O \\ 4 & \not{7} & \not{3} \\ + \; 1 & 0 & 0 \\ \hline 5 & 0 & 0 \end{array}$$
        $473 \approx 500$

INTRODUCTION TO POWERS / INDICES

Using the formula for area of a square:

e.g. A $=$ 5×5

              $=$ 5^2

    a) 4^2 $=$ 4×4

              $=$ 16

    b) 10^2 $=$ 10×10

              $=$ 100

    c) 3^2 $=$ 3×3

              $=$ 9

    d) 5^2 $=$ 5×5

              $=$ 25

NUMBER PATTERNS AND SEQUENCE

A multiple is a product got after multiplying factors.

6 is a multiple of 2 since 2 x 3 = 6 where 2 and 3 are factors.

18 is a multiple of 1, 3, 6, 9 and 2 since

1 x 18	=	18
2 x 9	=	18
3 x 6	=	18

List down all the multiples of 5 less than 27.

M5 = (1 x 5), (2 x 5), (3 x 5), (4 x 5), (5 x 5)

= 5　　10　　15　　20　　55

.: M5 = {5, 10, 15, 20, 25}

REF: Learning MTC bk 4 pg

MK Bk 4 pg 67

Finding the Lowest Common Multiples

1. List down 7 multiples of 6 and 3

M6 = {6,12,18,24,30,42...}

M3= {3,6,9,12,15,18,21}

2. Find the Common multiples from the above set of multiples.

3. Find the L.C.M. of 3 and 6

The L.C.M of 3 and 6 is 6

REF:　MK Bk 4 pg 67
Understanding MTC bk 4 pg 101
Learning MTC Bk 4 pg 19

FACTORS

Example

1. List down all the factors of 6.

   1×6 = 6
   2×3 = 6

   F_6 = {1, 2, 3, 6}

2. List down all the factors of 12.

   1×12 = 12
   2×6 = 12
   3×4 = 12

   F_{12} = {1, 2, 3, 4, 6,12}

3. List down all the factors of 48.

   1×48 = 48
   2×24 = 48
   3×16 = 48
   4×12 = 48
   6×8 = 48
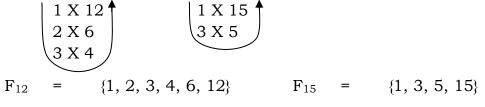
   F_{12} = {1, 2, 3, 4, 6, 8, 12, 16, 24, 48}

REF: MK Bk 4 pg 73

GREATEST COMMON FACTORS

Find the G.C.F. of 12 and 15

   F_{12}
   1×12
   2×6
   3×4

   F_{15}
   1×15
   3×5

F_{12} = {1, 2, 3, 4, 6, 12} F_{15} = {1, 3, 5, 15}

G.C.F. = 3

REF: MK Bk 5 pg 82

TYPES OF NUMBERS

1. Whole numbers
   These start from 0:   {0,1,2,3,4,5,6,7........}

2. Counting numbers
   Start from one:{1,2,3,4,5,6,7,8....}

3. Even numbers
   These are numbers which are exactly divisible by 2 or a number when divided by 2 leaves 0 as a remainder. {2,4,6,8,10,...........}
   N.B.   The first even number is 2.

REF: MK Bk 4 pg 60
      Supplementary MTC Bk 4 pg
      Learning MTC Bk 4 pg 17

4. Odd numbers
   These are numbers which are not exactly divisible by 2 or when divided by 2 leave a remainder as one.

   Example: {3,5,7,9,11,13,15,17,........}

5. Prime numbers
   A prime number is a number which has only two factors, that is, one and itself.

   Prime numbers less than 50 are:
   {2,5,7, 11, 13, 17, 19, 23, 29, 31, 37,41, 43, 47 }

6. Composite numbers
   These are numbers that have more than two factors.

   Example: {4,6,8,9,10,12,14,15,......}

REF: Supplementary MTC bk 4 pg

SEQUENCE

1. What is the next number in the sequence?

   2, 6, 10, 14, 18, 22   i.e. 18
   +4 +4 +4 +4   +4   +4   + 4
                                            22

2. What is the next number in the sequence?

   21, 18, 15, 12, 9   i.e. 12
   -3   -3 -3 -3 -3   - 3
                                             9

3. Find the missing number.

   2, 3,   5,   7,   11   (Prime numbers)

4. Find the missing number;

   64, 32, 16, 8, _____

5. Find the next number.

   1, 3, 9, 27, _____

REF: Understanding MTK Bk 4 pg 38

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GEOMETRY

Drawing line segments using rulers.

LINES

A line is a set of points illustrated as

Ray

A ray is a line with one end point.

A line segment has two end points.
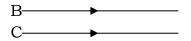
A line segment is named by its end points

A _____ B $\overline{AB}$

Parallel lines

Parallel lines are lines which do not meet.
They have the same distance apart at every point.

A ──────▶

B ──────▶
C ──────▶
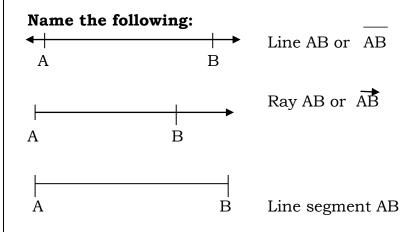
REF: MK BK 5 PG 175
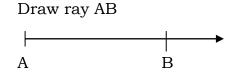
Naming lines, rays and line segments.

Lines are named according to the points through which they pass.

Name the following:

◀──┼────────┼──▶   Line AB or $\overline{AB}$
   A   B

├────────┼────▶   Ray AB or $\overrightarrow{AB}$
A   B

├─────────────┤   Line segment AB
A   B

Drawing rays and lines

Example

Draw ray AB

├────────┼────▶
A   B

Draw line CD

D   D

Drawing line segments of given length

Instruments to use:

- A sharp pencil
- A ruler
- A pair of compasses
-
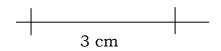
Example:

Draw a line segment of length 3 cm.

Procedure:

- Draw a line of any length
- Mark a point at the beginning of the line.
- Place a ruler on the marked point such that the point is marked "0" cm on t he ruller is a marked point on the paper.
- Measure 3 cm.

3 cm

Measuring line segments

Instruments used:

- Ruler

Example:

Measure line AB

A   B
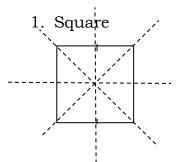
Procedure:

- Place the ruler at A such that the point marked 0cm is at point A.
- Take the reading which corresponds with point B, i.e.,
- AB   = 5cm

REF: Understanding MTC Bk 4 pg 7
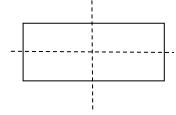
Drawing and naming quadrilaterals.

These are 4 sided figures e.g. squares, rectangles, rhombus, parallelograms, kites, trapeziums, etc.

1. Square
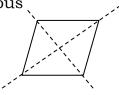
- It has 4 equal sides
- It has 4 lines of symmetry.

2. Rectangle
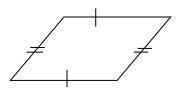
- It has 4 sides
- Opposite sides are equal
- Has two lines of symmetry

3. Rhombus
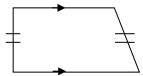
- It has 4 equal sides
- It has 2 lines of symmetry.

4. Parallelogram
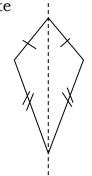
- It has 4 sides
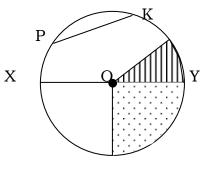- Opposite sides are equal and parallel
- Has one line of symmetry.

5. Trapezium

6. Kite

- Opposite sides are equal
- Has one line of symmetry

REF: MK BK 5 pg 184.

Understanding MTK bk 4 pg

Parts of a circle.

PK	-	Chord
XO	-	Radius
XY	-	Diameter
Shaded part-		Sector
Dotted part -		Quadrant

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1. **Finding diameter when radius is given**.

    D = r x 2

    e.g.   Find the diameter of circle whose radius is 5cm
    Diameter   =   r x 2
               =   5 cm x 2
               =   10 cm

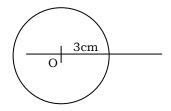2. **Finding radius when diameter is given**.
    R = D ÷ 2

    e.g.   Find the radius of circle whose diameter is 14cm
    Radius   =   D ÷ 2
             =   14 cm ÷ 2
             =   7 cm

3. **Drawing circles using a ruler and a pair of compass**.
    Exp.   Construct a circle of radius 3cm.
    - Draw a line and mark a point to be the centre of the circle.
    - Open the compass to radius of 3cm.
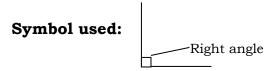   - Draw a circle round the centre.

Types of angles:

1. **Acute angle:**
    It is an angle which measures between 0^0 and 90^0.
    e.g. 30^0, 45^0, 15^0, 89^0, etc.

2. **Right angle:**
    It is an angle measuring exactly 90^0.

    Symbol used:

3. **Obtuse angle**.
    It is an angle which measures more than 90^0 but less than 180^0.

4. **Reflex angle**.
    It is an angle which measures more than 180^0 but less than 360^0.
    e.g. 185^0, 240^0, 350^0, etc.
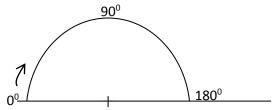
    REF: MK BK 5 pg 193.

Drawing and measuring angles using a protractor.

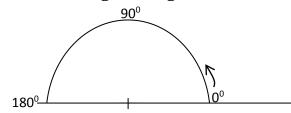1. <u>Using outer scale.</u>
   Procedure:
   - Draw a line
   - Mark a point on the line
   - Place the protractor such that its centre is on the point marked on the line.
   - Take the reading starting from zero clockwise.

2. <u>Using inner scale.</u>
   Procedure:
   - Draw a line
   - Mark a point on the line
   - Place the protractor such that its centre is on the point marked on the line.
   - Take the reading starting from zero anticlockwise.

REF:

MK Mathematics Bk 5 pg 195

Understanding MTC BK 4 pg 87.