

## P.4 SELF STUDY WORK

### MATHEMATICS

#### TOPIC: SETS

##### Lesson 1

##### sets.

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

#### TYPES OF SETS

##### 1. Empty set or null set.

This is a set without any members.

Symbol:  $\{ \}$  or  $\Phi$

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.  $\nleftrightarrow$  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**

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

N.B. Common members are written once.

Symbol:  $\cup$

e.g. Set  $P = \{a, e, , o, u\}$

$Q = \{2, 4, 6, 8\}$

Set  $P \cup Q = \{a, e, , o, u, 2, 4, 6, 8\}$

## INTERSECTION SET

This set with the common members of the given set.

Symbol: " $\cap$ "

e.g.  $P = \{1, 2, 3, 4, 5\}$

$B = \{0, 1, 3, 4, 5\}$

Find:

a)  $P \cap B = \{2, 3, 4, 5\}$

b)  $P \cup B = \{0, 1, 2, 3, 4, 5\}$

5.  $A = \{\text{Banana, Orange}\}$

$B = \{\text{Apple, Orange}\}$

Find:

a)  $A \cap B = \{\text{Orange}\}$

b)  $A \cup B = \{\text{Banana, Orange, Apple}\}$

**Week 1 lesson 2**

## **NUMBER OF MEMBERS (Review)**

Symbol:  $n()$

## **Examples**

1.  $P = \{a, b, c\}$

How many members are in set P.?

$n(P) = 3$  members.

2.  $M = \{\text{days of the week}\}$

Find  $n(M)$

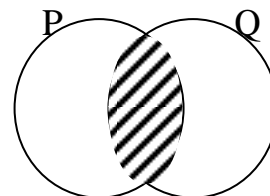
$M = \{\text{Mon, Tue, Wed, Thur, Fri, Sat, Sub}\}$

Find:  $n(M) = 7$

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

## **VENN DIAGRAM**

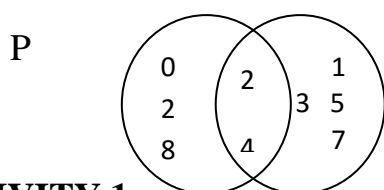
Representing information on a Venn diagram:



|                             |            |                          |
|-----------------------------|------------|--------------------------|
| Members<br>Of Set P<br>Only | $P \cap Q$ | Members of<br>Set Q only |
|-----------------------------|------------|--------------------------|

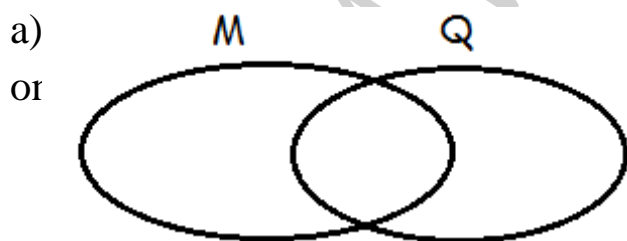
### Example:

Given  $P = \{0, 2, 4, 6, 8\}$   
 $Q = \{1, 2, 3, 4, 5, 7, 8\}$   
 Find:  $P \cap Q = \{2, 4\}$   
 $A \cup B = \{0, 1, 2, 3, 4, 5, 6, 7, 8\}$   
 Represent the sets on a Venn diagram.



### ACTIVITY 1

21. Given that set  $M = \{k, m, n, o, p\}$   
 $Q = \{m, a, n, g, o\}$



b) Find  $M \cup Q$

c) Find  $n(M)$

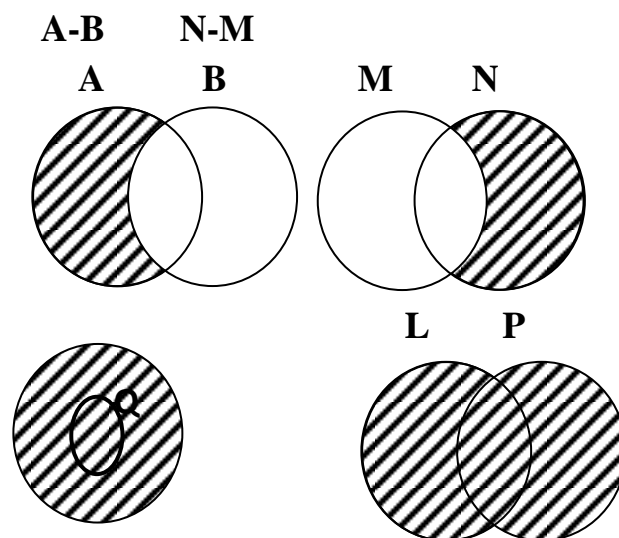
2. Given  $M = \{1, 3, 5, 7, 8\}$   
 $N = \{1, 2, 3, 4, 5, 7, 8\}$

- (i) Find:  $P \cap Q = \{ \}$   
 (ii)  $A \cup B = \{ \}$   
 (iii) Represent the sets on a Venn diagram.

### Week 1 lesson 3

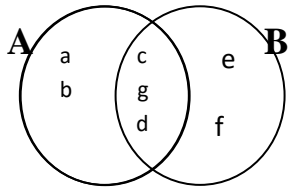
### Shading Venn Diagrams (Review)

#### Example:



AUB    A∩B    KUL    P∩B

### Getting information from a Venn Diagram (Review)



List down all members of Set;

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

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

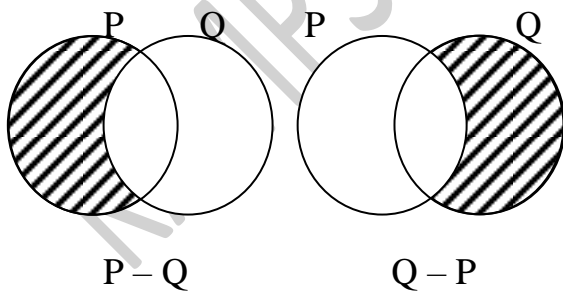
$$A \cap B = \{ c, d, g \}$$

$$A \cup B = \{ a, b, c, d, g, e, f \}$$

$$n(A \cap B) = 3 \text{ members}$$

### Difference of sets (Review)

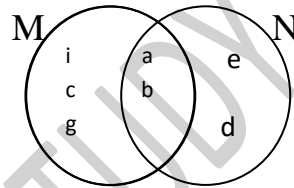
$P - Q$  means members of set P which are not in Set Q, that is, members found in Set P only.



**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:  $M - N = \{ i, c, g \}$

$$N - M = \{ d, e \}$$

### Week 1 lesson 4

#### SUBSETS

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

Symbol: “C”

“ $\not\subset$ ” means not a subset of.

#### Example:

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

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

( $T \subset D$ )

S is a subset of D

( $S \subset D$ )

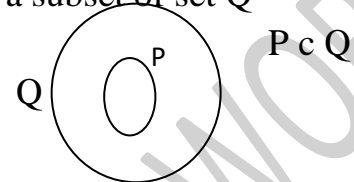
K is not a subset of D

( $K \not\subset D$ )

### Using a Venn diagram to represent a subset

Using a Venn diagram to represent subsets.

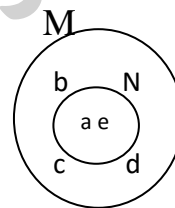
Set P is a subset of set Q



Given:  $M = \{a, b, c, d, e\}$

$N = \{a, e\}$

Represent the sets on a Venn diagram.

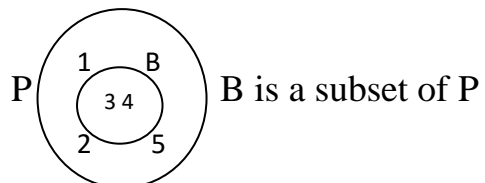


Find:  $M \cap N = \{a, e\}$

$M \cup N = \{a, b, c, d, e\}$

$n(M \cup N) = 5$  Members

Q What is the relationship between P and B?



Find:  $P \cap B = \{3, 4\}$

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.

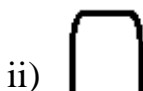
- A set itself is a subset of that set.

## ACTIVITY 2

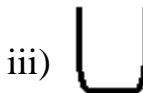
1. Name the following set symbols.



i) \_\_\_\_\_



ii) \_\_\_\_\_



iii) \_\_\_\_\_

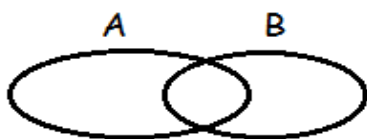
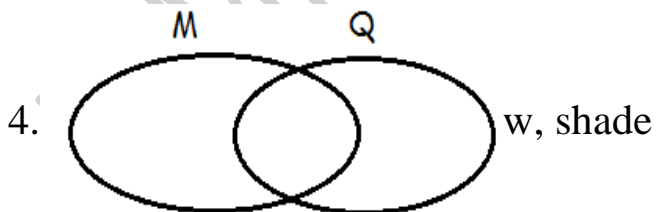


2. If set  $M = \{\text{All vowel letters}\}$ , list down the elements of set  $M$ .

3. Given that set  $M = \{k, m, n, o, p\}$

$$Q = \{m, a, n, g, o\}$$

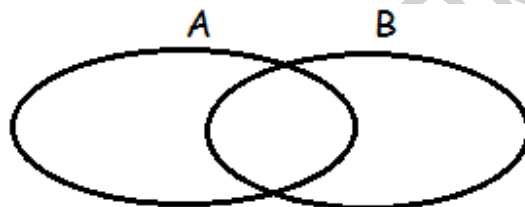
a) Represent the above information on the Venn diagram below.



5. Given that  $A = \{1, 2, 3, 4, 5\}$

$$B = \{2, 4, 6, 8, 9\}$$

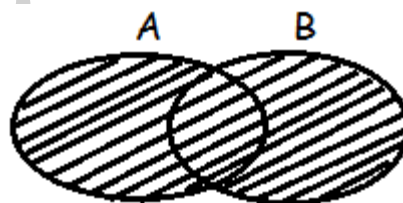
a) Complete the Venn diagram.



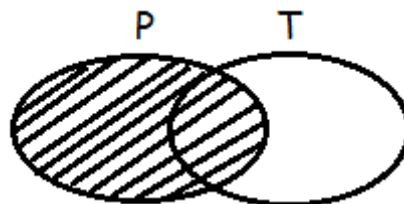
b) Find  $n(A \cap B)$

6. State the shaded regions.

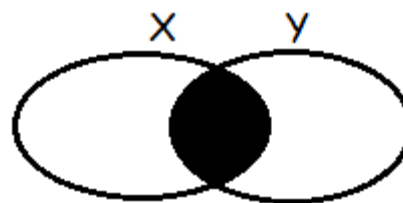
i)



ii)



iii)



## NUMERACY

### Week 1 lesson 5

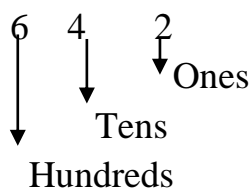
#### Whole Numbers

#### Place value and value of whole numbers (Review)

| Numerals | 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    |

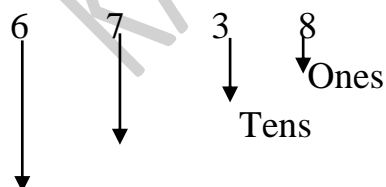
Finding the place value of the given digits.

What is the place value of 4 in 642?



∴ The place value of 4 is Tens.

Find the place value of each digit in 6738.



Hundreds

Thousands

∴ The place value of 6 is Thousands

The place value of 7 is Hundreds

The place value of 3 is Tens

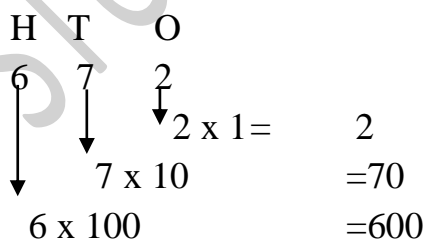
The place value of 8 is Ones

### Week 1 lesson 7

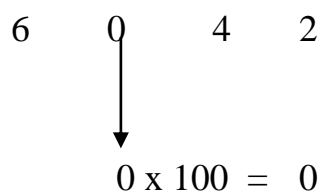
#### Value of wholes

Value = digit x place value

Find the value of each of the digits in 672



Find the value of 0 in 6042



What is the value of 2 in 432?

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

REF: MK Bk 4 pg 20

### Week 1 lesson 7

#### 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 | =       | + 20 |
|   |        |         | 23   |

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                  |

### Week 2 lesson 2

#### 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.

### ACTIVITY 3

1. Express the following in words

(i) 754, 001

(ii) 62,070

(iii) 53,800

(iv) 3,749

(v) 101,010

(vi) 44,477

(vii) 29,0193

2. What is the sum of the place value of 6 and 2 in the number 1236?

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

4. Find the place value of each digit in 7084.

5. Find the value of 0 in 80420

### Week 2 lesson 3

#### 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

### Week 2 lesson 4

#### 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

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

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REF: - MK Bk 4 pg 23

- Learning MTC Bk 4 pg 6

- Understanding MTC Bk 4 pg 14

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### Week four lesson two

#### Writing the expanded numbers in short.

Find the number which has been expanded to get;

$$\begin{array}{r} 1. \quad 4000 \times 200 \times 40 \times 7 \\ \quad \quad \quad 4000 \\ \quad \quad \quad 200 \\ \quad \quad \quad 40 \\ \quad \quad \quad + \quad 7 \\ \hline \quad \quad \quad 4347 \end{array}$$

$$2. \quad (5 \times 100) + (6 \times 1000) + (4 \times 1)$$

$$500 + 6000 + 4$$

$$6000$$

$$500$$

$$+ \quad 4$$

$$\hline 6504$$

$$3. \quad (9 \times 10000) + (4 \times 1000) + (7 \times 10)$$

$$90000 \quad + \quad 4000 \quad + \quad 70$$

$$90000$$

$$4000$$

$$+ \quad 70$$

$$\hline 94070$$

REF: - Learning MTC Bk 4 pg 6

- Understanding MTC bk 4 pg 4

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### Week 2 lesson 5

#### ROMAN NUMERALS – up to one hundred.

Basic Roman Numerals are;

$$1 = I \quad 50 = L \quad 1000 = M$$

$$5 = V \quad 100 = C$$

$$10 = X \quad 500 = D$$

#### 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 = V + I = VI  
7 = 5 + 2 = V + II = VII  
60 = 50 + 10 = L + X = LX

700 = 500 + 200 = D + CC = 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

**Week 2 lesson 6**

**Expressing Roman numerals into Hindu Arabic numbers.**

Convert the following to Hindu Arabic numerals:

1. XIV = X + IV  
= 10 + 4  
= 14

2. XXXIX = XXX + IX  
= 30 + 9  
= 39

$$\begin{aligned}
 3. \text{ XLV} &= \text{XL} + \text{V} \\
 &= 40 + 5 \\
 &= \underline{45} \\
 4. \text{ XCVIII} &= \text{XC} + \text{VIII} \\
 &= 90 + 8 \\
 &= 98 \\
 5. \text{ DCCVII} &= \text{DCC} + \text{VII} \\
 &= 700 + 7 \\
 &= 707
 \end{aligned}$$

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

#### ACTIVITY 4

1. Convert the following to Hindu Arabic numerals:

- (i) XVI
- (ii) XXVII
- (iii) LXV
- (iv) CCXX
- (v) VIII
- (vi) XVI

#### Week 2 lesson 7

#### Writing Hindu Arabic in Roman numerals

##### Examples

1. Change 25 into Roman numerals  
 $25 = 20 + 5$

$$\begin{aligned}
 &= \text{XX} + \text{V} \\
 &= \text{XXV} \\
 2. \text{ Express 49 in Roman numerals} \\
 49 &= 40 + 9 \\
 &= \text{XL} + \text{IX} \\
 &= \text{XLIX}
 \end{aligned}$$

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

#### Week 3 lesson 1

#### OPERATION ON NUMBERS

##### Addition:

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

##### Examples:

1. Find the sum of;

$$\begin{array}{r}
 \text{a) } \begin{array}{r} 7464 \\ + 4425 \\ \hline 11889 \end{array}
 \end{array}$$

$$\begin{array}{r}
 \text{b) } \begin{array}{r} 146708 \\ + \quad 5 \\ \hline 146713 \end{array}
 \end{array}$$

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

$$\begin{array}{r}
 469 \\
 943 \\
 + 6401 \\
 \hline 7813
 \end{array}$$

∴ 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

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### Subtraction of wholes numbers

Words used include; **Reduce, Decrease, Difference, etc.**

1. Subtract:

$$\begin{array}{r} \text{a) } 8432 \\ - 4732 \\ \hline \underline{3700} \end{array}$$

$$\begin{array}{r} \text{b) } 532867 \\ 314658 \\ \hline \underline{218209} \end{array}$$

2.

3. Subtract 94 from 342.

$$\begin{array}{r} 342 \\ - 94 \\ \hline \underline{248} \end{array}$$

4. What is the difference of 143 and 36?

$$\begin{array}{r} 143 \\ - 36 \\ \hline \underline{107} \end{array}$$

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

$$\begin{array}{r} \text{Sh. } 630 \\ - \text{Sh. } 560 \\ \hline \underline{\text{Sh. } 070} \end{array}$$

REF: - Primary MTC Bk 4 pg 30

- Primary MTC for Uganda bk 4 pg 20-32

- Understanding MTC Bk 4 pg 18-25

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### Multiplication of wholes.

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

$$\begin{array}{r} \text{1. } 13 \\ \times 2 \\ \hline \underline{26} \end{array} \quad \begin{array}{r} \text{2. } 43 \\ \times 4 \\ \hline \underline{172} \end{array} \quad \begin{array}{r} \text{3. } 120 \\ \times 5 \\ \hline \underline{600} \end{array}$$

REF: Primary MTC for Uganda bk 4 pg 36

MK Bk 4 pg 46

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### Week five lesson five

#### Multiplying numbers by 10 and 20.

$$\begin{array}{r} \text{2. } 42 \\ \times 10 \\ \hline \end{array} \quad \begin{array}{r} \text{2. } 54 \\ \times 20 \\ \hline \end{array} \quad \begin{array}{r} \text{3. } 32 \\ \times 10 \\ \hline \end{array}$$

$$\begin{array}{r} \times 10 \\ 420 \\ \hline \end{array} \quad \begin{array}{r} \times 10 \\ 540 \\ \hline \end{array} \quad \begin{array}{r} \times 20 \\ 640 \\ \hline \end{array}$$

REF: MK bk 4 pg 50

### Week six lesson one

### Multiplying 2-digit numbers by 2 digit numbers

1.  $\begin{array}{r} 13 \\ \times 12 \\ \hline 10 + 2 \\ (13 \times 10) + (13 \times 2) \\ \hline 156 \end{array}$

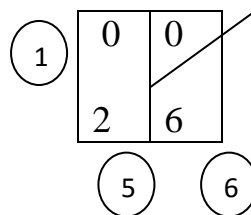
2.  $\begin{array}{r} 45 \\ \times 12 \\ \hline 10 + 2 \\ (45 \times 10) + (45 \times 2) \\ \hline 540 \end{array}$

### Multiplying using lattice method:

e.g.  $13 \times 12$

|   |   |
|---|---|
| 0 | 0 |
| 1 | 3 |

$\begin{array}{r} \times \\ 1 \\ 2 \end{array}$



= 156

REF: Primary MTC for Uganda bk 4 pg 40

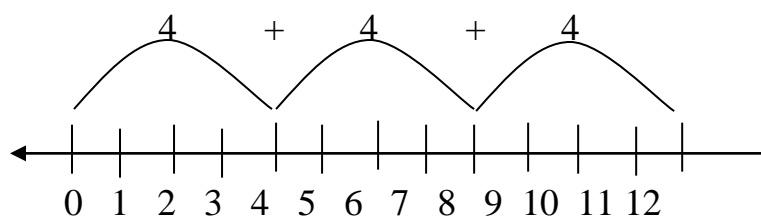
MK Bk 4 pg 50

Understanding MTC BK 4 pg 26-30

### MULTIPLICATION OF NUMBERS ON A NUMBERLINE

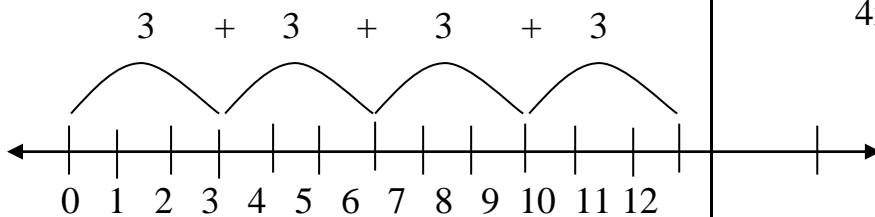
E.g.

1.  $3 \times 4$



= 12

2.  $4 \times 3$



$\underline{\underline{12}}$

**Divisions of 3 digit numbers by one digit**

**Use of long division**

Exp: 1  $468 \div 2$

$$\begin{array}{r} 234 \\ 2 \overline{) 468} \\ \underline{2} \phantom{00} \\ 26 \phantom{0} \\ \underline{2} \phantom{00} \\ 06 \phantom{0} \\ \underline{0} \phantom{00} \\ 06 \phantom{0} \\ \underline{0} \phantom{00} \\ 00 \end{array}$$

$$\begin{array}{r} \times 2 \\ 00 \\ 12 \\ \underline{24} \\ 36 \\ \underline{48} \\ 510 \\ 612 \\ 714 \\ 816 \\ \underline{918} \end{array}$$

Exp: 2 Share 570/= among 5 girls

$$\begin{array}{r} 114 \\ 5 \overline{) 570} \\ \underline{5} \phantom{00} \\ 07 \phantom{0} \\ \underline{0} \phantom{00} \\ 07 \phantom{0} \\ \underline{0} \phantom{00} \\ 00 \end{array}$$

$$\begin{array}{r} \times 2 \\ 00 \\ 15 \\ \underline{210} \end{array}$$

$$\begin{array}{r} 1 \times 5 = 05 \\ 20 \\ 4 \times 5 = 20 \\ 00 \end{array}$$

$$\begin{array}{r} 315 \\ 420 \\ 525 \\ 630 \\ 735 \\ 840 \\ 945 \end{array}$$

$\underline{\underline{114}}$

## 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

$= 2 + 1$                        $= 1 + 4 + 4$

$= 3$                                        $= 9$

$= 3 \div 3$                                        $= 9 \div 3$

$\underline{\underline{1}}$                                        $\underline{\underline{3}}$

### Divisibility test of 5:

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

e.g. 95, 240,

### **Week seven lesson one**

### **INTRODUCTION OF COMBINED OPERATIONS**

#### **Use BODMAS**

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

Exp. 1. Work out:

$$\begin{aligned} & 4 + 1 - 2 \\ = & (4 + 1) - 2 \\ = & 5 - 2 \\ = & \underline{\underline{3}} \end{aligned}$$

2. Simplify:

$$\begin{aligned} & 4 + 2 + 5 \\ = & 4 + (2 \times 5) \\ = & 4 + 10 \\ = & \underline{\underline{14}} \end{aligned}$$

### **Week seven lesson two**

#### Properties of zero:

1.  $0 \times 0 = 0$
2. Zero multiplied by any number gives 0.  
i.e.  $0 \times 25 = 0$        $k \times 0 = 0$   
 $7 \times 0 = 0$
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.  $0 \div 5 = 0$   
 $\frac{0}{21} = 0$



### Properties of one:

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

$$\text{i.e. } 1 \times 20 = 20$$

$$y \times 1 = y$$

$$0 \times 1 = 0$$

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

$$\text{i.e. } \frac{4}{1} = 4$$

$$y \div 1 = y$$

### Week seven lesson three

#### 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 |

$$\text{Magic number} = 2 + 5 + 8$$

$$= 15$$

$$a = 15 - (8 + 6)$$

$$= 15 - 14$$

$$= \underline{\underline{1}}$$

#### **ACTIVITY**

1. Subtract 65 from 334

2. What is the difference of 129 and 72?

3. Sam had Shs. 7800. He bought a cowboy for Shs. 5600. How much money remained?

4. Share 59000/= among 10 girls

5. A book costs sh.1000.

Find the cost of 3 similar books.

6. If he went with 10,000/= and bought all the items, how much was his change?

## 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 number

#### Examples to tens:

1. 23  $\approx$  20
2. 46  $\approx$  50
3. 125  $\approx$  130

#### Examples to hundreds:

1. 142  $\approx$  100
2. 361  $\approx$  400

**N.B.** Use a number line.

### Rounding off:

1. Round off to the nearest tens:

|       |  |
|-------|--|
| a) 47 | T O  |
|       | 4 <del>7</del>                               |
|       | + <u>1 0</u>                                 |
|       | <u>5 0</u> <u>47 <math>\approx</math> 50</u> |
| b) 63 | T O  |

$$\begin{array}{r} 6 \cancel{3} \\ + 00 \\ \hline 60 \quad 63 \approx 60 \end{array}$$

2. Round off to the nearest hundreds.

a) 349

|   |   |   |              |
|---|---|---|--------------|
|   | H | T | O            |
|   | 3 | 4 | <del>9</del> |
| + | 0 | 0 | 0            |
|   | 3 | 0 | 0            |

$349 \approx 300$

b) 473

|   |   |              |              |
|---|---|--------------|--------------|
|   | H | T            | O            |
|   | 4 | <del>7</del> | <del>3</del> |
| + | 1 | 0            | 0            |
|   | 5 | 0            | 0            |

$473 \approx 500$

**Week eight lesson two**

## INTRODUCTION TO POWERS / INDICES

**Using the formula for area of a square:**

e.g.  $A = 5 \times 5$   
 $= 5^2$

a)  $4^2 = 4 \times 4$   
 $= 16$

b)  $10^2 = 10 \times 10$   
 $= 100$

c)  $3^2 = 3 \times 3$   
 $= 9$

d)  $5^2 = 5 \times 5$   
 $= 25$

## NUMBER PATTERNS AND SEQUENCE

A multiple is a product got after multiplying factors.

6 is a multiple of 2 since  $2 \times 3 = 6$  where 2 and 3 are factors.

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

$$1 \times 18 = 18$$

$$2 \times 9 = 18$$

$$3 \times 6 = 18$$

---

List down all the multiples of 5 less than 27.

$$M5 = (1 \times 5), (2 \times 5), (3 \times 5), (4 \times 5), (5 \times 5)$$

$$= 5 \quad 10 \quad 15 \quad 20 \quad 25$$

$$\therefore M5 = \{5, 10, 15, 20, 25\}$$

## Finding the Lowest Common Multiples

1. List down 7 multiples of 6 and 3

$$M_6 = \{6, 12, 18, 24, 30, 36, 42, \dots\}$$

$$M_3 = \{3, 6, 9, 12, 15, 18, 21\}$$

---

---

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

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REF: MK Bk 4 pg 67

Understanding MTC bk 4 pg 101

Learning MTC Bk 4 pg 19

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## FACTORS

### **Example**

1. List down all the factors of 6.

$$\begin{array}{l} 1 \times 6 = 6 \\ 2 \times 3 = 6 \end{array}$$

$$F_6 = \{1, 2, 3, 6\}$$

2. List down all the factors of 12.

$$\begin{array}{l} 1 \times 12 = 12 \\ 2 \times 6 = 12 \\ 3 \times 4 = 12 \end{array}$$

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

3. List down all the factors of 48.

$$\begin{array}{l} 1 \times 48 = 48 \\ 2 \times 24 = 48 \\ 3 \times 16 = 48 \\ 4 \times 12 = 48 \\ 6 \times 8 = 48 \end{array}$$

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

REF: MK Bk 4 pg 73

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## GREATEST COMMON FACTORS

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

$$\begin{array}{l} F_{12} \\ 1 \times 12 \\ 2 \times 6 \\ 3 \times 4 \end{array}$$

$$\begin{array}{l} F_{15} \\ 1 \times 15 \\ 3 \times 5 \end{array}$$

$$F_{12} = \{1, 2, 3, 4, 6, 12\} \quad F_{15}$$

$$= \{1, 3, 5, 15\}$$

$$\text{G.C.F.} = 3$$

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REF: MK Bk 5 pg 82

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## TYPES OF NUMBERS

### 1. Whole numbers

These start from 0:  $\{0, 1, 2, 3, 4, 5, 6, 7, \dots\}$

### 2. Counting numbers

Start from one:  $\{1, 2, 3, 4, 5, 6, 7, 8, \dots\}$

### 3. Even numbers

These are numbers which are exactly divisible by 2 or a number when divided by 2 leaves 0 as a remainder.  
 $\{2, 4, 6, 8, 10, \dots\}$

N.B.

The first even number is 2.

### 4. Odd numbers

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

Example:  $\{3, 5, 7, 9, 11, 13, 15, 17, \dots\}$

### 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:

$\{2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47\}$

### 6. Composite numbers

These are numbers that have more than two factors.

Example:  $\{4, 6, 8, 9, 10, 12, 14, 15, \dots\}$

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REF: Supplementary MTC bk 4 pg

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## SEQUENCE

### 1. What is the next number in the sequence?

2, 6, 10, 14, 18, 22

i.e. 18

$\begin{array}{c} +4 \\ \hline +4 \end{array}$

+4 +4 +4 +4 +4 +4

22

### 2. What is the next number in the sequence?

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

$$\begin{array}{r} -3 \quad -3 \quad -3 \quad -3 \quad -3 \\ -3 \quad -3 \quad -3 \quad -3 \quad -3 \\ \hline 9 \end{array}$$

## ALGEBRA

### Week two lesson one

#### Addition and subtraction of letters

$$\begin{aligned} 1. \text{ Add: } & (2y + 3y) + 4y \\ & = 5y + 4y \\ & = 9y \end{aligned}$$

$$\begin{aligned} 2. \text{ Subtract: } & 10k - k \\ & = 10k - 1k \\ & = 9k \end{aligned}$$

### ACTIVITY

1. Find the missing number.

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

2. Find the missing number;

64, 32, 16, 8, \_\_\_\_\_

3. Find the next number.

1, 3, 9, 27, \_\_\_\_\_

4. List down all the factors of 68.

5. Find the L.C.M. of 6 and 12

6. List down 7 multiples of 4 and 8

$$7. \text{ Add: } (4x + 5v) + x$$

### Week three lesson one

#### Collecting like terms

$$\begin{aligned} 1. \text{ Collect like terms: } & 4x + 8y + 2x + 5y \\ & = (4x + 2x) + (8y + 5y) \\ & = 6x + 13y \end{aligned}$$

$$\begin{aligned} 2. \text{ Collect like terms: } & 9m + 7n - 2m - 3n \\ & = (9m - 2m) + (7n - 3n) \\ & = 7m + 4n \end{aligned}$$

#### Substitution

Substitution means to replace:

1. If  $x = 3$ ,  $y = 4$  and  $z = 5$ , Find the value of

$$\begin{aligned} & = x + y + z \\ & = (3 + 4) + 5 \\ & = 7 + 5 \\ & = 12 \end{aligned}$$

2. If  $h = 12$ , find the value of  $5h$

$$\begin{aligned} 5h \text{ means } & 5 \times h \\ & = 5 \times 12 \\ & = 60 \end{aligned}$$

#### Solving equations involving addition

1. Find the missing number

$$\square + 3 = 9$$

$$\begin{array}{rcl} \square + 3 - 3 & = & 9 - 3 \\ \square & = & 6 \end{array}$$

∴ The missing number is 6

2. Solve for k

$$\begin{array}{rcl} K + 4 & = & 9 \\ K + 4 - 4 & = & 9 - 4 \\ K & = & 5 \end{array} \quad \begin{array}{rcl} \text{If } 3 + m & = & 8 \\ \text{What is } m? & & \\ 3 + m & = & 8 \\ - 3 + m & = & 8 - 3 \\ m & = & 5 \end{array}$$

### Forming and solving equations with addition

Wamala had some books. He got 3 more books. Altogether he had 7 books. How many books did he have before?

$$8 - 159$$

Let the books he had be x.

$$\begin{array}{rcl} x + 3 & = & 7 \\ x + 3 - 3 & = & 7 - 3 \\ x & = & 4 \end{array}$$

### Equations involving subtraction

1. If  $\square - 4 = 6$ , Find the value of what is in the box

$$\begin{array}{rcl} \square - 4 & = & 6, \\ \square - 4 + 4 & = & 6 + 4 \\ \square & = & 10 \end{array}$$

∴ The value of what is in the box is 10.

2. Solve for m:

$$\begin{array}{rcl} m - 3 & = & 2 \\ m - 3 + 3 & = & 2 + 3 \\ m & = & 5 \end{array}$$

### Forming and solving equations with subtraction

Mullohi had some goats. When he sold them he remained with 9 goats. How many goats had he before?

Let the number of goats he had be g.

$$\begin{array}{rcl} g - 5 & = & 9 \\ g - 5 + 5 & = & 9 + 5 \\ g & = & 14 \end{array}$$

### Equations involving multiplication

1. If  $x \square = 12$ , What is in the box?

$$\begin{array}{rcl} \square \times 3 & = & 12 \\ \square \times 3 \div 3 & = & 12 \div 3 \\ \square \times 1 & = & 4 \\ \square & = & 4 \end{array}$$

∴ The box has got 4

2. If  $3P = 21$ , Find P

$$\begin{array}{rcl} 3P & = & 21 \\ \frac{3P}{3} & = & \frac{21}{3} \\ P & = & 7 \end{array}$$

### Forming equations with multiplication

There are 4 groups in a class. Each group has the same number of pupils. Altogether there are 40 pupils. How many pupils are in each group?

Let the pupils in each group be c.

$$4 \times c = 40$$

$$\frac{4c}{4} = \frac{40}{4}$$

$$c = 10$$

$$C = 10$$

∴ Each group has 10 pupils.

### Equations involving division

3. If  $\square \div 2 = 4$ , What is in the box?

$$\square \div 2 = 4$$

$$\square \div 2 \times 2 = 4 \times 2$$

$$\square \div 1 = 8$$

$$\square = 8$$

∴ The box has got 8

4. Solve for x:

$$x \div 3 = 6$$

$$\frac{x}{3} = \frac{6}{1}$$

$$x \times 1 = 3 \times 6$$

$$x = 18$$

5.  $\frac{a}{2} = 3$

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

$$a \times 1 = 2 \times 3$$

$$a = 6$$

### Forming equations involving division

Nakandi had some balls. She divided them into 4 groups. If there were 12 balls in each group, how many balls did she have altogether?

Let the balls she had be b.

$$b \div 4 = 12$$

$$b \div 4 \times 4 = 12 \times 4$$

$$b = 48$$

∴ She had 48 balls altogether.

### Week ten lesson one

### Equations involving more than one operation

1. Solve for y.

$$2y + 5 = 17$$

$$2y + 5 - 5 = 17 - 5$$

$$2y = 12$$

2. Solve for m

$$3m - 9 = 12$$

$$3m - 9 + 9 = 12 + 9$$

$$3m = 21$$



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

$$y = 6$$

$$\frac{3m}{3} = \frac{21}{3}$$

$$m = 7$$

### ACTIVITY

1. If  $x = 2$ ,  $y = 6$  and  $z = 5$ ,  
Find the value of  $2x + y + 3z$
2. Simplify :  $m + y + 2y + 5m$ .
3. Solve:  $y + 1 = 9$
4. Find the difference between 86  
and 43.
5. Share 20 books among 5 boys  
equally.

|                        |                            |
|------------------------|----------------------------|
| 6.a) $\square + 5 = 9$ | b) $\square \times 4 = 12$ |
| c) $\square - 7 = 8$   | d) $\square \div 3 = 7$    |

7.(a) Multiply:

$$\begin{array}{r} 243 \\ \times 3 \\ \hline \end{array}$$

b) Add:

$$\begin{array}{r} 1293 \\ + 1568 \\ \hline \end{array}$$

8. Find the missing number.

$$\square + 2 = 5$$

9. Use a number line to add  $3 + 4$ .



10. Use 3, 9, 6 to form the:

a) Largest three-digit numeral.

b) Smallest three-digit numeral.

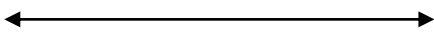
c) Find the sum of the largest and smallest numbers formed.

## GEOMETRY

### Drawing line segments using rulers.

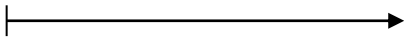
#### LINES

A line is a set of points illustrated as



#### Ray

A ray is a line with one end point.



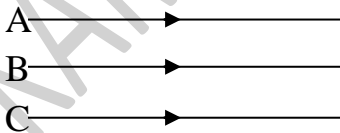
A line segment has two end points.

A line segment is named by its end points



#### Parallel lines

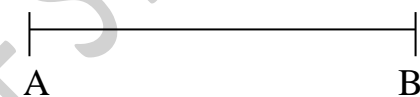
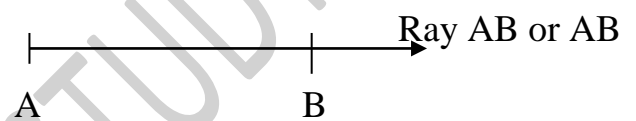
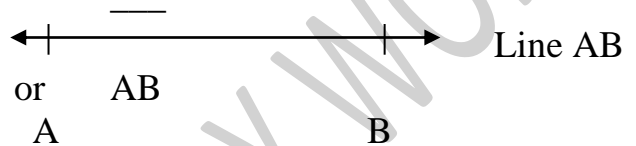
Parallel lines are lines which do not meet. They have the same distance apart at every point.



#### Naming lines, rays and line segments.

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

Name the following:

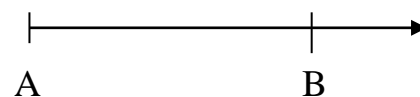


Line segment AB

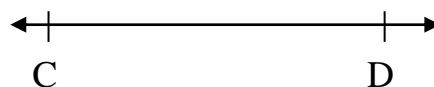
#### Drawing rays and lines

##### Example

Draw ray AB



Draw line CD



## Drawing line segments of given length

### **Instruments to use:**

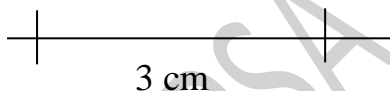
- A sharp pencil
- A ruler
- A pair of compasses
- 

### **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 the ruler is a marked point on the paper.
- Measure 3 cm.



### **Measuring line segments**

### **Instruments used:**

- Ruler

### **Example:**

Measure line AB

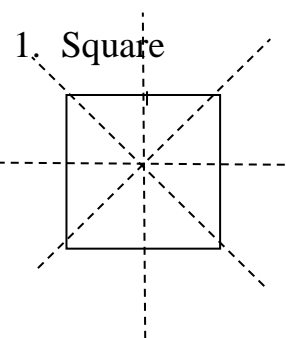


### **Procedure:**

- 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.,
- $AB = 5\text{cm}$

### **Drawing and naming quadrilaterals.**

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



It has 4 equal sides  
It has 4 lines of symmetry.

2. Rectangle

It has 4 sides

Opposite sides are equal

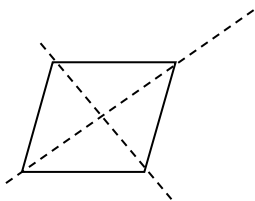
Has two lines of symmetry



3. Rhombus

It has 4 equal sides

It has 2 lines of symmetry.

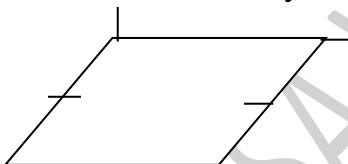


4. Parallelogram

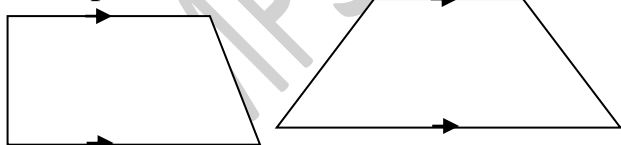
It has 4 sides

Opposite sides are equal and parallel

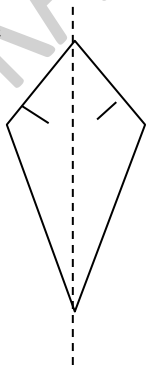
Has one line of symmetry.



5. Trapezium



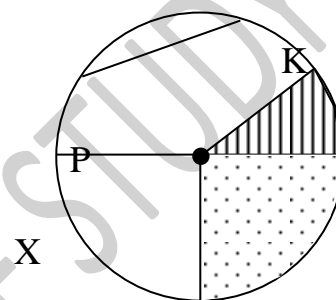
6. Kite



Opposite sides are equal

Has one line of symmetry

Parts of a circle.



PK- Chord

XO- Radius

XY- Diameter

Y Shaded part- Sector

Dotted part -Quadrant

Finding diameter when radius is given.

$$D = r \times 2$$

e.g. Find the diameter of circle whose radius is 5cm

$$\begin{aligned} \text{Diameter} &= r \times 2 \\ &= 5 \text{ cm} \times 2 \\ &= \underline{\underline{10 \text{ cm}}} \end{aligned}$$

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

$$R = D \div 2$$

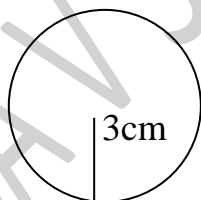
e.g. Find the radius of circle whose diameter is 14cm

$$\begin{aligned}\text{Radius} &= D \div 2 \\ &= 14 \text{ cm} \div 2 \\ &= \underline{\underline{7 \text{ cm}}}\end{aligned}$$

**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:**

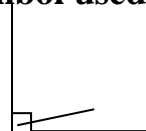
It is an angle which measures between  $0^\circ$  and  $90^\circ$ .

e.g.  $30^\circ$ ,  $45^\circ$ ,  $15^\circ$ ,  $89^\circ$ , etc.

2. **Right angle:**

It is an angle measuring exactly  $90^\circ$ .

**Symbol used:**



Right angle

3. **Obtuse angle.**

It is an angle which measures more than  $90^\circ$  but less than  $180^\circ$ .

4. **Reflex angle.**

It is an angle which measures more than  $180^\circ$  but less than  $360^\circ$ .

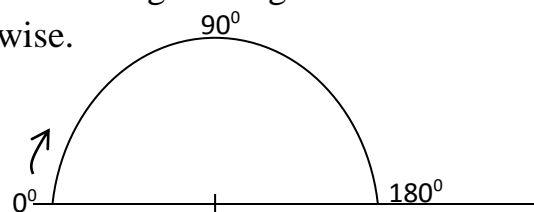
e.g.  $185^\circ$ ,  $240^\circ$ ,  $350^\circ$ , etc.

**Drawing and measuring angles using a protractor.**

1. Using outer scale.

**Procedure:**

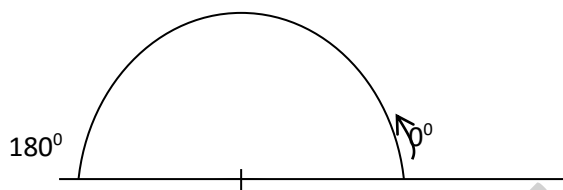
- Draw a line
- Mark a point on the line
- Place the protractor such that its centre is on the point marked on the line.
- Take the reading starting from zero clockwise.



2. Using inner scale.

**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.  $90^\circ$



**ACTIVITY**

1. Find the value of  $k$  in degrees.