**MATHEMATICS JSS 1**

**FIRST TERM**

## SCHEME OF WORK

**SUBJECT: MATHEMATICS CLASS: JSS1**

|  |  |
| --- | --- |
| **Weeks** | **Topic** |
| **1** | **Whole Numbers Counting and Writing (i) Millions (ii) Billions (iii) Trillions** |
| **2** | **Whole Numbers Continued: Problems solving in quantitative aptitude reasoning using large numbers** |
| **3** | **Lowest Common Multiple (L.C.M) and Highest Common Factor (H.C.F) of Whole Numbers. (a) Concepts of L.C.M and H.C.F (b) L.C.M and H.C.F of quantitative reasoning** |
| **4** | **Fractions: (a) Meaning of Fraction (b) Types of fractions (Proper & Improper) (c) Mixed numbers** |
| **5** | **Fractions continued: Equivalent Fractions ( Identify and apply equivalent fractions in showing commodities and problems solving in quantitative aptitude)** |
| **6** | **Fractions continued. (a) ordering of fractions (b) conversion of fractions to percentage and vice versa (c) conversion of fraction to decimal and vice versa** |
| **7** | **Review of the first half term’s work and periodic test** |
| **8** | **Fractions continued: Addition and subtraction of fractions** |
| **9** | **Fractions Continued: (a) Multiplication and Division of fractions (b) Prime numbers and factors** |
| **10** | **Estimation: (i) Concept of estimation and reasons (ii) Estimation of dimensions and reasons (iii) Estimation of capacity(volumes) and mass of objects (iv) Estimation of other things (v) Quantitative reasoning involving estimation** |
| **11** | **Revision of the 1st term’s work and preparation for the first term examination** |
| **12** | **First term examination** |

**WEEK ONE**

**TOPIC: WHOLE NUMBERS**

**CONTENT**

* Introduction
* System of Counting
* Counting in Millions
* Counting inBillions and Trillions

**INTRODUCTION**

1. **Counting**

The origins of mathematics can be traced back to the earliest days of human civilization when people began counting and measuring as integral aspects of their daily lives. This fundamental need prompted the development of numerical systems and the use of various bases for counting.

Ancient societies, initially relying on their fingers and toes, devised ingenious methods for counting and grouping numbers. This practice led to the establishment of numerical bases, with the most prevalent being five, ten, and twenty. For instance, an individual with thirty-two cows might express this as 'I possess six sets of five and two cows' when using the base-ten system, which is the most commonly employed and is also known as the decimal system.

**Other bases of counting: seven and sixty**

7 days = 1 week

60 seconds = 1 minute

60 minutes = 1 hour

In English, **‘dozen’** means 12, **‘score’** means 20 and **‘gross’** means 144

**System of Counting**

1. **Tally System**

The evolution of counting systems didn't stop with the adoption of numerical bases. Early human societies developed various systems for recording and tracking numbers. One of the earliest known methods is the tally system, where tally marks were likely the first numerical notations used. These marks were etched onto stones or carved into sticks. Today, tally marks are still employed, particularly in the field of statistics, to count and record extensive data.

A tally mark of 5 is written by putting a line across a tally count of 4.

i.e = 4 and = 5

Example 1

Draw the tally marks for each of the following numbers:

1. 34 (b) 15

Solution

1. 34 =
2. 15 =

**EVALUATION**

1. During a dry season, it did not rain for 128 days. How many weeks and days is this?
2. What is the number represented by
3. Draw the tally marks for each of the following numbers: (a) 43 (b) 52
4. **Roman numerals**

The Romans used capital letters of the alphabets to represent numbers. Many people believe that the Romans used the fingers to represent numbers as follows:

I for one finger, II for two fingers, III for three fingers, V for five fingers and X for the combination of two hands ( or two V’s) .

The Roman also used L for fifty, C for hundred, D for five hundred and M for one thousand as shown below.

|  |  |  |  |
| --- | --- | --- | --- |
| Hindu-Arabic | Roman Numeral | Hindu-Arabic | Roman Numeral |
| 1 | I | 20 | XX |
| 2 | II | 40 | XL |
| 3 | III | 50 | L |
| 4 | IV | 60 | LX |
| 5 | V | 90 | XC |
| 6 | VI | 100 | C |
| 7 | VII | 400 | CD |
| 8 | VIII | 500 | D |
| 9 | IX | 900 | CM |
| 10 | X | 1000 | M |

The Roman used the subtraction and addition method to obtain other numerals. For example

1. IV means V- I i.e. 5- 4 = 4
2. VI means V+ I, i.e. 5 + 1 = 6
3. IX means X- I, i.e. 10 – 1 = 9
4. XXIV means XX + IV = 20 + 4 = 24
5. CD means D- C = 500 – 100 = 400
6. MC means M + C = 1000 + 100 = 1100

Example 1

Change the following numbers to Roman numerals: (a) 2459 (b) 3282

Solution

1. 1456--- 1000 = M

400 = CD

50 = L

6 = VI

2459 = MCDLIV

1. 3282 = 3000 + 200 + 80 + 2

= MMM CC LXXX II

i.e 3282 = MMMCCLXXXII

**EVALUATION**

1. Write the following Roman figures in natural ( or counting) numbers:
2. MMMCLIV (b) MMCDLXXI (c) MCMIX (d) DCCCIV
3. Write the following natural numbers in Roman figures:
4. 2659 (b) 1009 (c) 3498 (d) 1584
5. **The Counting board**

A counting board is a block of stone or wood ruled in columns. Loose counters, pebbles, stones or seeds in the columns show the value of the numbers in the columns.

Counters in the right-hand column (U) represent units, counters in the next column (T) represent tens, and so on.

|  |  |  |  |
| --- | --- | --- | --- |
| TH | H | T | U |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  | ●●● | ● |
|  | ●● | ●●●● | ●●●● |

2 7 5

The diagram below is a counting board showing the number 275.

1. **The Abacus**

An abacus is a frame consisting of beads or disks that can be moved up or down (i.e. slide) on a series of wires or strings. Each wire has its own value. Both abacus and counting board work in the same way when carrying out calculations.

Example 1

**M HTH TH H T U**

**3**

**0**

**7**

**2**

An Abacus showing 2703

1. **Place Value of Numbers**

Numbers of units, tens, hundreds,…….., are each represented by a single numeral.

(a).For a whole number:

- the units place is at the right-hand end of the number.

- the tens place is next to the units place on the left, and so on

For example: 5834 means ↓

5 thousands, 8 hundreds, 3 tens, and 4 units.

See the illustration below:

5 8 3 4

(b) for decimal fraction, we count the places to the right from the decimal point as tenths, hundredths, thousandths, etc.

See the illustration below:

↓ ↓ ↓ ↓ ↓

6 . 7 9 8

6 → units

. → decimal

7 → tenths

9 → hundredths

8 → thousandths

Example 1:

What is the place value of each of the following?

1. the 9 in 10269
2. the 2 in 2984

Solution:

1. the 9 in 10269 is = 9 units or nine units
2. the 2 in 2984 is = 2 thousands or two thousands

Example 2

What is the value of each of the following?

1. the 8 in 1.85
2. the 0 in 16.08

Solution:

1. the 8 in 1.85 is = 8 tenths or eight tenths
2. the 0 in 16.08 is =0 in tenths or zero tenths

Example 3

What is the value of each digit in 3 865 742

Solution

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 3 | 8 | | 6 | 5 | | 7 | 4 | 2 | |
| M | H. Th | | T.Th | Th | | H | T | U | |
| **Digit** | | **Value** | | | **Word Form** | | | |
| 3 | | 3 000 000 | | | Three million | | | |
| 8 | | 800 000 | | | Eight hundred thousand | | | |
| 6 | | 60 000 | | | Sixty thousand | | | |
| 5 | | 5 000 | | | Five thousand | | | |
| 7 | | 700 | | | Seven hundred | | | |
| 4 | | 40 | | | Forty | | | |
| 2 | | 2 | | | Two | | | |

**EVALUATION**

1 (a) The place value of 5 in 5763 is ……………

(b)What is the place value 1 in 5.691?

2. Give the value of each digit in 489 734

3. Write down the number shown in the following figures:

(a)

**Counting and Writing in millions, billions and trillions**

The figures 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 are called digits or units.

The table below gives the names and values of some large numbers.

|  |  |
| --- | --- |
| Name | Value |
| **One thousand** | **1 000** |
| Ten thousand | 10 000 |
| One hundred thousand | 100 000 |
| **One million** | **1 000 000** |
| Ten million | 10 000 000 |
| One hundred million | 100 000 000 |
| **One billion** | **1 000 000 000** |
| **One trillion** | **1 000 000 000 000** |

Large numbers can be read easily by grouping the digits in threes starting from the right hand side as shown below.

gap

gap

gap

three

digits

three

digits

three

digits

**Billion Million TH H T U**

25 800 074 4 3 0

The 1st gap separates hundreds from thousands and the second gap separates thousands from millions and the third gap separates million from billion.

Thus 25 800 074 430 reads twenty five billion, eight hundred million, seventy four thousand, eight hundred and ninety.

Example

Write the following in figures:

1. twelve billion, three hundred and nine million, ninety five thousand, six hundred and sixty three
2. six trillion, four hundred and thirty billion, one hundred and five million, two hundred and one thousand and fifty four
3. nine hundred and four billion, five hundred and forty million, three hundred and seventy thousand, seven hundred and fifty

Solution

1. You can work it out as follows:

|  |  |
| --- | --- |
| Twelve billion | = 12 000 000 000 |
| Three hundred and nine million | = 309 000 000 |
| Ninety five thousand | = 95 000 |
| Six hundred and sixty three | = 663 |
| **Adding** | **= 12 309 095 663** |

|  |  |
| --- | --- |
| Six Trillion | = 6 000 000 000 000 |
| Four hundred and thirty billion | = 430 000 000 000 |
| One hundred and five million | = 105 000 000 |
| Two hundred and one thousand | = 201 000 |
| Fifty four | = 54 |
| **Adding** | **= 6 430 105 201 054** |

|  |  |
| --- | --- |
| Nine hundred and four billion | = 904 000 000 000 |
| Five hundred and forty million | = 540 000 000 |
| Three hundred and seventy thousand | = 370 000 |
| Seven hundred and fifty | = 750 |
| **Adding** | **= 904 540 370 750** |

**EVALUATION**

1. Write the following in figures:
2. Ninety nine million, eighty thousand, nine hundred and forty one.
3. Fifteen trillion, six hundred and seventy one billion, three hundred and ninety one million, eighty eight thousand, five hundred and fifty five.
4. Write in figures, the number referred to in the statement: Last year a bank made a profit of ‘two hundred and twenty billion, five hundred and one thousand, four hundred and ninety three Naira ( N)

**WEEKEND ASSIGNMENT**

1. The value of 8 in 18214 is (a) 8 units (b) 8 tens ( c) 8 hundreds ( d) 8 thousands (e) 8 ten thousands
2. The Roman numerals CXCIV represents the number (a) 194 (b) 186 (c ) 214 (d) 215 (e) 216.
3. What is the number represented by ? (a) 32 (b) 40 (c) 28 (d) 39
4. The value of 7 in 3.673 is (a) 7tenths (b) 7 hundredths ( c ) 7 units ( d) 7 hundredth.
5. Three million and four in figures is (a) 300004 (b) 300040 (c) 30000004 (d) 3000004

**THEORY**

* 1. Change this Roman figure to natural numbers

(i) MMCDLXXI (ii) MMMCLIV

1. Write the following in figures:

(a) fifteen trillion, six hundred and seventy one billion, three hundred and ninety one million, eighty eight thousand, five hundred and fifty five.

(b) three hundred and twenty-nine billion, five hundred and sixty two million, eight hundred and one thousand, four hundred and thirty three.

**WEEK TWO**

**TOPIC: WHOLE NUMBERS**

**CONTENT**

* Ordering Large Numbers
* Using Mixture of Digits and Words with Large Numbers
* Problems Solving in Quantitative Aptitude Reasoning (QR) using large numbers

**Ordering Large Numbers**

Any 2-digit number is larger than every unit number, e.g 11 is larger than 9. Any 3-digit number is larger than every 2-digit number;e.g 132 is greater than 86, and so on.

When a set of numbers are given, it is useful to rearrange the numbers in such a way that those that start in such a way that those that start with the same digit can be compared.

**Example 1**

Find the smallest and the largest number from the following set of numbers:

2 675 571, 3 498 567, 2 670 781, 3 497 859

**Solution**

Comparing numbers that start with 2

compare digits in this column

2 6 7 **5** 5 7 1

smaller number

2 6 7 **0** 7 8 1

smallest digit

Comparing numbers that start with 3

largest digit

larger number

3 4 9 **8** 5 6 7

3 4 9 **7** 8 5 9

The smallest number is **2 670 781** and the largest number is **3 498 567.**

The numbers in the example above can also be arranged in order of size starting with the smallest as follows:

**2 670 781, 2 675 571, 3 497 859, 3 498 567**

This arrangement is also called **ascending order.** The reverse is known as **descending order.**

**Example 2**

Arrange these numbers in order of size magnitude) starting with the smallest: 13456786, 24567432, 38479871, 24558011, 13498069, 38478817.

**Solution**

Always group large numbers in threes.

Arranging the numbers that start with 1 in order of size: **13 456 786, 13 498 069**

Arranging the numbers that start with 2: **24 558 011, 24 567 432**

Arranging the numbers that start with 3: **38 478 817, 38 479 871**

Hence, arranging these numbers in order of magnitude gives: **13 456 786, 13 498 069, 24 558 011, 24 567 432, 24 558 011, 24 567 432**

**EVALUATION**

1. Arrange the following numbers in ascending order: 89728567, 89704567, 89693670, 89776909, 89735890.
2. Arrange the following numbers in descending order: 217679057, 497378939, 234656452, 21023404895, 2100998969.

**Using Mixture of Digits and Words with Large Numbers**

People often get confused when reading and writing large numbers. To avoid the confusion, the editors of newspapers use a combination of **digits** and **words** to show large numbers. For example, 1 million people, $ 1.5 billion, N 3.6 trillion.

Some newspapers headlines are as follows:

* Unemployment soaring to 10.7 million
* HIV rose to an estimated 23 million in 2010
* Cost of ID rises to £10 billion in the UK.

**Example 1**

Write these numbers as a mixture of digits and words:

1. £30 000 000 (b) N75 000 000 000 (c) $460 000 000 (d) £3 400 000 000 000

**Solution**

1. £30 000 000 = £30 x 1 000 000

= £30 million

1. N 75 000 000 000 = N 75 x 1 000 000 000

= N 75 billion

1. $460 000 000 = $460 x 1 000 000

= $460 million

1. £3 400 000 000 000 = £3.4 x 1 000 000 000 000

= £3.4 trillion

**Example 2**

Write the following numbers in digits

1. 3.6 million (b) 2 billion

**Solution**

1. 3.6 million = 3.6 x 1 000 000

= **3 600 000**

1. 2 billion = 2.75 x 1 000 000 000

= 2 750 000 000

**Large Numbers (QR)**

The S. I system of units is an internationally agreed method of measuring quantities such as length, mass, capacity and time.

Example 1.

Express the following in millimeter.

(a) 173 cm (b) 5.9km (c ) 200m

**Solution**

1. 173 cm to mm

Since 1cm = 10mm

Then, 173cm = 173 x 10

= 1 730mm

1. 5.9km to mm

1cm = 10mm, 100cm = 1m, 1000m = 1km. Therefore, 1 000 000mm = 1 km

* 1. km = 5.9 x 1 000 000mm

= 5 900 000 or 5.9 million(mm)

1. 200m to mm

1m = 1000mm

200m = 200 x 1 000mm

= 200 000mm or 200 thousand (mm)

**EVALUATION**

1. Write these numbers in digits only and group the digits of your answers in threes.
2. billion (b) £0.85 trillion (c) million litres
3. Write these numbers as a mixture of digits and words: (a) 780 000 barrels (b) 900 000 km (c) $ 900 000 000
4. Change the following to the unit in brackets: (a) 5000kg (grams) (b) 1250 litres ( mL)

**WEEKEND ASSIGNMENT**

* 1. What is the value of 1.2 km in metres? (a) 120m (b) 1 200m (c ) 12 000m (d ) 120 000m
  2. Which of the following numbers is the largest?(a) 727345565 (b) 727245565 (c)727445565 (d) 726778876.
  3. million in digits only is (a) $1 200 000 (b) $1 140 000 (c) $1 250 000 (d) $125 000
  4. Le 5 600 000 in digits and words is (a) Le 56 million (b) Le 5.6 billion (c) Le 0.56 billion (d) Le 5.6 million
  5. 13 500 000mm in km is (a) 13.5 km (b) 1.35 km (c) 1350 km (d) 13500 km

**THEORY**

1. Write these numbers in digits only: (a) Le 0.5 billion (b) $ 9.1 million
2. Write down the missing number (QR):
3. 100 987 331, 101 987 331, 102 987 331, \_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_, 105 987 331
4. 980 231 680, 980 231 682, \_\_\_\_\_\_\_\_, 980 231 686, \_\_\_\_\_\_\_\_\_\_\_\_, 980 231 690.

**WEEK THREE**

**TOPIC: LEAST COMMON MULTIPLE AND HIGHEST COMMON FACTOR OF WHOLE NUMBERS**

**CONTENT**

* + Multiples
  + Common Multiples
  + Least Common Multiples (LCM)
  + Highest Common Factors (HCF).

**Multiples**

Multiples mean finding the product of a positive integer with another positive integer. Simply put, when a whole number multiples another whole number, the result obtained is called the multiple of either of those numbers.

The first four multiples of 12 are

12 x 1 = 12

12 x 2 = 24

12 x 3 = 36

12 x 4 =48

Thus, we write 12, 24, 36 and 48 as the first for multiples of 12.

Note: Every whole number has an infinite number of multiples

Every whole number has a finite number of factors.

Example 1

Find the next five multiple of the following whole numbers.

(a) 4 (b) 8 (c ) 11.

Solution

In these questions, the numbers are not to be included because it reads next.

(a) 4, 4 x 1 = 4 (not included)

4 x 2 = 8

4 x 3 = 12

4 x 4 = 16

4 x 5 = 20

4 x 6 = 24

:. The next five multiples of 4 are 8, 12, 16, 20 and 24.

(b) 8, 8 x 1 =8 multiple of 11

8 x 2 =16 11 x 1 =11

8 x 3 =24 11 x 2 = 22

8 x 4 =32 11 x 3 = 33

8 x 5 =40 11 x 4 = 44

8 x 6 = 48 11 x 5 = 55

11 x 6 = 66

the next five multiples of the next five multiples of 11 are 22, 33,44,55 and 66

8 are 16, 24, 32, 40 and 48.

Example 2

Which of the following numbers 18, 20, 27 36 and 50 are

* + 1. multiples of 2
    2. multiples of 3
    3. multiples of 4.

Solution

When a number can be divided exactly by another number it means the quotient is a multiple of the divisor. 18, 20, 27 36, 50

* + 1. multiples of 2 are 18, 20, 27 36, 50
    2. multiples of 3 are 18, 27 and 36
    3. multiple of 4 are 20 and 36.

**EVALUATION**

1. 1.Find the next 7 multiples of the following numbers.

(a) 15 (b) 25 (c ) 13.

1. Which of the following whole numbers 37, 68, 51, 128, 85 and 187 are

(a) multiples of 2

(b) multiples of 3

(c) multiples of 5

(d) multiples of 17.

**Common multiples**

When two or more numbers have a multiple in common, then the numbers is known as a common multiple.

Example

Find the first two common multiples of 4.6 and 8.

Solution

Their multiple are as shown below;

4 = 4, 8, 12, 16, 20 (24) 28,32, 36, 40, 44, (48) 52,56,60,64……

6 = 6, 12, 18,(24), 30, 36, 42, (48), 54, 60, 66, 72.

8= 8, 16,(24), 32, 40, (48), 56, 64, 72,

Considering the three whole numbers, their first two common multiples are

24 and 48.

Examples

Write down three common multiples of the following sets of numbers

(a) 5 and 6

(b) 3, 10 and 15.

Solution

(a) First three common multiples of 5 and 6.

5 = 5, 10, 15, 20, 25, (30),35, 40 45, 50, 55 (60) 65, 70,75,80 85,(90) 95,100, 105,110,115,120.

6= 6, 12,18,24, (30),36, 42,48,54,(60),66,72,78,84, (90),96,102,106,114,120.

:.The first three common multiples of 5 and 6 are, 30 60 and 90.

(b) First three common multiples of 3, 10 and 15

3= 3,6,9,12,15,18,21, 24,27, (30),33,36,39,42,45,81,84,87,(90),93,96.

10= 10, 20, (30), 40, 50, (60) 70, 80 (90),100,110, etc

15 = 15, (30), 45,(60), 75, (90), 105, 120.

:. The first three common multiples of 3, 10, and 15 are 30, 60 and 90.

**EVALUATION**

Find the first four common multiples of the following sets of numbers

(a) 4 and 7 (b) 2,5 and 7 (c ) 3, 6, 9.

**Least Common Multiples (LCM)**

You can find the least common multiples of two or more numbers by listing as many multiples as you need until you have one that is common to both or all the numbers.

For instance to find the LCM of 24 and 15

Multiples of 24 = 24, 48, 72,96, 120………

Multiples of 15 = 15, 30, 45, 60, 75,90, 105, 120.

Although the numbers will have many common multiples but, looking at what we are after, that is the least of the common multiples, the answer will be 120.

:. LCM of 24 and 15 = 120.

Rather than writing out a long list of multiples for each number, you can use the prime factors method to find the LCM. This is the method we are going to apply.

Example 1

Find the LCM of the following whole numbers:

(a) 24 and 15 (b) 8 and 45 ( c ) 16 and 18 (d) 90, 105 and 210.

Solution

(a) The LCM of 24 and 15

2 24 15 2 8 45

2 12 15 2 4 45

2 6 15 2 2 45

3 2 5 3 1 45

5 1 1 3 1 15

3 1 5

5 1 1

LCM = 2 x 2 x 2 x 3 x 5= 120 Lcm = 2 x 2 x 2 x 3 x 3 x 5 = 360

:.LCM of 24 and 15 = 120 ;. LCM of 8 and 45 = 360.

(c) LCM of 16 and 18 (d) LCM of 90, 105 and 210

2 16 18 2 90 105 210

2 8 9 3 45 105 105

2 4 9 3 15 35 35

2 2 9 5 5 35 35

2 1 9 7 1 7 7

3 1 3 1 1 1

3 1 1cc

LCM = 2 x 2 x 2 x x 2 x3 x3 = 144 LCM = 2 x 3 x 3 x 5 x 7 = 630

:. LCM of 16 and 18 = 144 :. LCM of 90, 105 and 210 is = 630.

Given that the numbers are expressed as a product of prime factors, the lcmis the product of the prime factors of the numbers without double counting.

Example 2

Find the LCM of the following .Leave your answers in prime factors.

(a) 2 x 2 x 3, (b )2 x 2 x 5

2 x 2 x 2 x 5 3 x 5 x 7

2 x 2 x5 2 x 3 x 3 x 3

2x 2 x 3 x 3 x 5 3 x 5 x 5 x 7.

Solution

(a) 2 x 2 x 3

2 x 2 x 2 x 5

2 x 2 x 5

2 x 2 x 3 x 3 x 5

LCM = 2 x 2 x2 x 3 x 3 x 5.

(b) 2 x 3 x 3

3x 5x 7

2 x 3 x 3 x 3

3 x 5 x 5 x 7

LCM = 2 x 3 x 3 x 3 x 5 x 5 x 7.

**EVALUATION**

1.Find the LCM of the following

(a) 4,6, and 9 (b) 6, 8, 10 and 12 (c ) 9, 10,12 and 15 (d) 108 and 360.

2. Find the Lcm of the following leaving your answers in index form.

(a) 2 x 2 x 2 x 3 x 3 (b) 3 x 3 x 5

2 x 3 x 5 x5 2 x 3 x 7

2 x 2 x 3 x 3 x 5 2 x 5 x 5 x 7

(c) 23 x 32 x 5

3 x 53 x 72

24 x 3 x 72,

32 x 52 x 73

**Highest Common Factor**

Highest common factor (HCF) of two or more numbers is the largest number that divides exactly into all the numbers.

Example 1

Find the HCF of 21 and 84.

Solution

3 21 2 84

7 7 2 42

1 3 21

7 7

1

21 = 3 x 7

84 = 2 x 2 x 3 x 7

HCF = 3 x 7 = 21

Example 2

Find the HCF of 195 and 330.

Solution

3 195

5 65

1. 13

11

HCF of 195 and 330

195 = 3 x 5 x 13

330 = 2 x 3x5x11

HCF = 3 x 5 = 15

1. 330
2. 165

5 55

11 11

1

Example 3

Find the HCF of 288, 180 and 106. leave your answer in index form.

Solution

2 288 2 180 2 108

2 144 2 90 2 54

2 72 3 45 3 27

2 36 3 15 3 9

2 18 5 5 3 3

3 9 1 1

3 3

1

288 = 2 x 2 x 2 x2x2 x 3 x 3

180 = 2x2 x 3 x 3

108 = 2x2 x3 x 3x3

HCF = 2x 2x 3 x 3 = 22 x 32 …….index form

= 36 (ordinary form).

Example 4

Find the HCF of the following . Leave the answers in prime factors and use index notation.

(a) 23 x 32 x 7

22 x 3 x 52

22 x 33 x 5

(b) 23 x 52 x 7

22 x 32 x 5

33 x 53 x 72

Solution

(a)23 x 32 x 7 = 2 x 22 x 3 x 3 x7

22 x 3 x 52 = 22 x 3 x 52

22 x 33 x 5 = 22x 3 x 32 x 5

HCF = 22 x 3 index form

4 x 3 = 12.

(b) 23 x 52 x 7 = 23x 52 x 7

22 x 32 x 5 = 22 x 32x 5

33 x 53 x 72= 33 x 53 x 72

The factor that is common is in 5

:. HCF = 5

**EVALUATION**

1.Findthe HCF of the following;

i. leaving your answers in index form

ii. leaving your answers in whole number

(a) 160, 96 and 224

(b) 189, 279and 108

(c) 126, 234 and 90.

2. Find the HCF of the following .Leave your answers in prime factors and use index notation.

22x 33 x 5

21 x 34 x 5

2 x 35 x 72

(b) 23 x 33 x 53

24 x 3 x 52 x 7

25 x 32 x 5 x 72

**WEEKEND ASSIGNMENT**

1. The value of 23 x 32 is (a) 1291 (b) 658 (c) 729 (d)7 36 (e) 54

2. The LCM of 12 and 15 is (a) 90 (b) 60 (c) 30 (d) 120 (e) 180

3. The HCF of 63and 90 is (a) 7 (b) 3 (c) 12 (d) 6 (e) 9

4. The first three common multiples of 3 and 11 are (a) 3, 33, 66, (b) 11, 33, 66 ( c ) 33, 66, 99 (d) 33, 44, 55 (e) 33, 22, 11.

5. Which of the following whole numbers 22, 11, 54, 35, 40, 75, and 105 is /are multiples of 5? (a) 11, 22, 35 (b) 35, 40, 75, 105 ( c ) 54, 35, 40, 75, 105 (d) 35, 54, 40, 75 (e) 105,75,40,35,54.

**THEORY**

1. Give the first five multiples of the following

I. 5 II 7 III. 11

B Write down four common multiples of the following sets of numbers

I. 3, 4 and 5 II. 3, 10 and 15.

2a. Find the LCM of

I. 9, 24, 32, and 90 II. 23 x 32 x 5 x 7

3 x 53 x 72

24 x 3 x 72

32 x 52 x 73

b. Find the HCF of

i. 126, 234 and 90 ii. 23 x 33 x 53

b. 63, 42, and 21 24 x 3 x 52 x 7

25 x 32 x 5 x 72

**WEEK FOUR**

**TOPIC: FRACTIONS**

**CONTENT**

A: Common Fractions

B. Types

(i) Proper Fractions

(ii) Improper Fractions

(iii) Simple Conversion

A: **COMMON FRACTIONS**

A fraction is a number which is represented by one integer – the numerator – divided by another integer – the denominator ( or the divisor).

Simply put, a fraction is a part of a whole number. It is not always possible to use whole numbers to describe parts of quantities. It is therefore, important to know that to describe parts of quantities, fraction is used for example.

**GENERAL FORM OF A FRACTION**

From the explanation given above, we can write fraction in the form

a/b where

a = the numerator

b= the denominator

Fraction is divided into

1. Common (Vulgar) Fractions

Here, the fraction is written as one number over another .

Numerator is the term given to the number on the top part of a fractions.

Denominator is the term given to the number at the bottom part of a fraction .For example

9 Numerator

11 Denominator

II. Decimal Fractions

Decimal fractions are simply called decimal numbers. It has numbers to the left and right of a decimal point. See week 5 for detail.

B.Types of Fractions (Common)

Common fractions are grouped under three headings. becausefractions are written as one integer divided by another – a ratio – they are called rational numbers.

Fractions are either proper,improper or mixed.

1.Proper Fractions : This is a common fraction having its numerator less than its denominator. Example

(a) 4/7 (b) 3/5 (c) 2/5 etc

2 Improper Fraction: This is a common fraction having its numerator greater than its denominator .examples.

11/5 (b) 4/3 39/11 (d) etc

3. Mixed Numbers: This type of fraction is in the form of an integer and a fraction. That is it has two parts.

- a whole number, and

- a fraction (usually a proper fraction)

Example is shown in the figure below

From the diagram, we can describe the fraction as 1 ½ oranges

Where,

1=whole number part and

½ = fractional part

**EVALUATION**

1.Give five examples each of the types of fraction

2. Using the shapes/figures below, write out the fraction stating whether it is a proper, improper or a mixed fraction.

I II

3. Simple Conversions: Conversions can be made from improper fractions to a mixed fraction and vice versa .Lets see some examples.

Example 1

Express the following improper fractions as mixed fractions

(a) 4/3  (b) 57/10 (c ) 93/20 (d) 113/ 3

Solution

(a) = = = 1 + =

Alternatively, divide the numerator by the denominator and express the remainder as the numerator of the fractional part of the mixed fractions. The number of times the numerator can be divided before the remainder is the whole number part.

Hence, 4 = 4 ÷ 3 = 1 remainder 1

3

= = 1 1/3

(b) 57/10 = = 50/10 + 7/10 = 5 + 7/10 = 57/10

(c )93/20 (d) 113/3

= 80 + 13 = 111 + 2

20 3

80 +13 = 111 + 2

20 20 3 3

= 4 + 13/20 = 37+ 2/3

= 4 13/20 = 37 2/3

**Example 2**

Conversion from Mixed numbers to Improper Fraction

Let A be the general form of a mixed number, where

A = whole number part

x/y = fractional part.

To convert to improper fraction, the following steps are followed.

1.Multiply the denominator of the fractional part by the whole number

2. Add the numerator of the fractional part to the result in (1) above.

3. Express the result in (2) above as the numerator of the improper fraction with the original denominator of the fractional part as the same denominator.

A = A y + x

y

Example 2

Express the following mixed fractions as improper fractions

(a) 5 ½ (b) 3 2/5( c) 7 1/8 (d) 10 1/3

Solution

(a) 5 ½ (b) 3 2/5

= 5 x 2 + 1 3 x 5 + 2

2 5

= 10 + 1 = 15 + 2

2 5

=11/2 = 17/5

( c) 7 1/8 (d ) 10 1/3

= 7 x 8 + 1 = 10 x 3 + 1

8 3

= 56 + 1 =

8

= =

**EVALUATION**

1. Express the following as mixed fractions

(a) 503/10 (b) 113/2

2. Express the following as improper fractions.

(a) 7 ½ (b) 33

**WEEKEND ASSIGNMENT**

1. Which of the following is not a proper fraction?(a) ¼ (b) ¾ (c )3/2 (d) 5/8

2. Express 3 1/7 as an improper fraction is (a) 11/7 (b)( c) 7/22 (d) 22/ 7

3.What fraction of the figure shown is shaded?(a) 2/11 (b) 3/9 ( c) 8/3 (d) 4/11.

4. Express 99/5 as a mixed fraction (a) 19 4/5 (b) 18 4/5 ( c) 19 5/4 (d) 18 5/4

5.The figures above can best be described as

(a) 2 ½ - mixed numbers

(b) 2 ¾ - proper fraction

(c) 2 ¾ -improper fraction

(d) 2 ¾ -decimal

**THEORY**

1. Distinguish clearly the various types of fraction known to you, giving 2 examples each.

2. Express (a) 103/5 as mixed fraction (b) 115 2/5 as improper fraction .

**WEEK FIVE**

**TOPIC: FRACTIONS**

**CONTENT**

I. Equivalent fractions

II. Concept of equivalent fractions in sharing commodities.

III. Problem solving in quantitative aptitude (QR).

**Equivalent Fraction**: Two or more fractions are said to be equivalent if they have the same values. Equivalent fractions can be obtained by multiplying or dividing the numerator and the denominator by the same number.

When the operation performed on the original fraction to get the new fraction is division, it is referred to as simplification .Here their common factor is used in dividing the numerator and the denominator.

i.Multiplication

:. The fraction 3/5, 6/10 and 12/20 are said to be equivalent fractions.

ii. Division

= 150 = 75 = 15

200 100 20

:. The fractions 150/200, 75/100 and 15/ 20 are said to be equivalent fractions.

iii. Simplification: by dividing both numerator and denominator by a common factor.

44 = 22

70 35

Example 1.

Find the missing numbers

(a) 1/3= 3/9 = 6/A = B/24 = 50/C = D/900 = 100/E

(b) 1/5 = 10/50 = = =

solution

(a) = 1/3 =3/9 = 6/A =B/24 = 50/C= D/900 = 100/E

= 1/3 =6/A, 1/3 = 1 x 6 = 6/18 A = 18.

= 1/3 =B/24, 1/3 = 1 x 8 = 8/24 B = 8

3 x 8

= 1/3 = 50/C, 1/3 = 1 x 50 = 50/150 , C = 150

= 1/3 =D/900 , 1/3 = 1 x 300 = 300/900 , D = 300

3 x 50

= 1/3 = 100/E, 1/3 = 1 x 100 = 100/300 , E = 300

3 x 100.

Thus, the missing numbers calculated will make the fractions equivalent.

= 1/3 =3/9 = 6/18 = 8/24 = 50/150 = 300/900 = 100/300.

(b)

= 1/5 = , 1/5 x 2/2, missing number = 2

= 1/5= 1/5 x 4/4 = 4/20 , missing number = 20

= 1/5= 1/5 x 20/20 = 20/100, missing number = 20

= 1/5= , 1/5 x 24/24 = 24/120,missing number = 120

Example

Find the missing numbers.

(a) =

(b) =

( c ) =

(d) 7 = 14

9

Solution

(a) 2 = ……. think of what will multiply 3 to give 18..

3 18

= 2/3 x 6/6 =2 x 6 = 12/18

3 x 6

:. The missing number is 12.

(b) 5 = 20 think of what will multiply 5 to give 20

6

= 5 x 4 = 20

6 4 24

the missing number is 24

(c ) 3 = ……

5 15 .think of what will multiply 5 to give 15.

= 3 x 3 = 3 x 3 = 9

5 3 5 x 3 15

:.the missing number is 9.

(d) 7 x 2 = 7 x 2 = 14

9 2 9 x 2 18 think of what will multiply 9 to give 18

:. The missing number is 18

**EVALUATION**

1.Find the missing numbers

¾ =6/8 = 15/A = 24/B = C/28 = D/100 = E/24

2. Find the missing numbers

i. 3 =

8 48

ii 5 =

9 36

iii. 5 = 20

6

**II.Equivalent Fractions in Sharing Commodities**

Problems involving sharing of commodities can be resolved with the knowledge of fractions. Some examples below will help us to understand this aspect of fraction.

Example1

Some notebooks where shared into 18 equally. If 5 exercise books were given to Ojo, what fraction is left?

Solution

Number of notebooks =18

Ojo’s share = 6

Number left = 18 – 6 = 12

Fraction left =12/18  = 12/18 ÷ 6/6

= 2/3

Example 2

Amarket woman had 90 yams. She sold2/3 of it. How many yam did she sell?

Solution

No of yams = 90

No sold = 2/3 of 90

= 2/3 x 90 = 2 x 30

= 60 yams

:. 60 yams where sold.

Examples

Some oranges were shared out. Olu got 3/8of them. He gave 5 to his brother and 4 to her sister and had 6 left. How many oranges were there altogether?

Solution

Fraction received by Olu = 3/8

No of oranges he gave out = 5 + 4 = 9

No of oranges left with him = 6 = 9 + 6 = 15.

As equivalent fraction, 3/8  =15/? = 3 x 5 =15/40.

8 x 5

:.40oranges were there altogether.

Example 4

In a shop, the price of a radio is reduced by one third .If the original price of the radio is N24, 000 what is the reduced price?

Solution

Original price = N2400

1/3 of this price = 1/3 x 2400 =N800

reduced price =2400- 800 = N1600.

Alternatively,

Consider the original price as unit

:. Reduced price = 1 - 1/3 = 2/3

2/3 of the unit price =2/3 x 2400 = N1600

**EVALUATION**

1. In a class of 40 students, ¼ are doing science subjects, 1/5are doing arts and the remaining are doing commercial subjects. How many students are :(a) doing science (b) commercial?

2. In a service. ¼ of the people are men , 1/3 are women and the rest are children. If there are 50 children, how many (a) people are there altogether (b) more women than men are there ?

III. **Problem Solving in Quantitative Aptitude**

Some of the examples under quantitative aptitude(reasoning ) have been seriously dealt with at the early part of this topic. Let us take some more examples .

Example 1

Find the missing numbers

( a) 16 = (B ) 10 =

48 3 168

( c ) 3 =

749

Solution

(a) 16 = think of a number that will divide 48 to give 3

48 3

= 16 ÷ 16 = 1

48 ÷ 16 3

:. The missing number is 1.

(b) 10 =

16 8 ‘ think of a number which will divide 16 to give 8’

= 10 ÷ 2 = 5

16 ÷ 2 8.

The missing number is 5.

( c) 3 = think of a number that will multiply 7 to give 49

7 49

= 3 x 7 = 3 x 7 = 21

7 7 7 x 7 49

:. The missing number is 21.

Example 2

Reduce the following fractions to their lowest terms/

(a) 5 (b) 24 ( c ) 14

100 54 21

Solution

The concept of equivalent fraction using division as the operation can be very helpful.

(a) 5 = 5 ÷ 5 = 1

100 100 ÷5 20

(b) 24 = 24 ÷2 = 12 = 12 ÷ 13 = 4

54 54 ÷2 27 27 ÷ 3 9

(c) 14 = 14 ÷7 = 12

21 21 ÷ 7 3

Example 3

What fraction of

1. 6 weeks is 6 days?
2. 650m is 1km?
3. 4mm is 10cm?
4. 500g is 2kg?

Solution

Before reducing fractions, the quantities must be in the same units.

(a) 6 weeks ………..6 days.

= 6 days

6 weeks

= 6 days= 6

6 x 7 days 6 x 7

= 1 the fraction = 1

7 7

(b) 650m -------- 1km

= 650 m = 650m = 65 ÷ 5 = 13

1km 1000m 1000 ÷ 5 20

(c) 4mm ……….10cm

= 4mm = 4mm = 4

10cm 10 x10 100

= 4 ÷ 4 = 1

100 ÷ 4 25

The fraction = 1/25.

(d) 500g ……….2kg

= 500g = 500g = 500 = 5

2kg 2000g 2000 20

= 5÷ 5 = 1

20 ÷ 5 4

the fraction is ¼

**EVALUATION**

1. Find the missing numbers

(a) 55 = 11

305 ?

(b) 9 = ?

11 99

2. Express 13 weeks as a fraction of 1 year.

**WEEKEND ASSIGNMENT**

1. Which of the following is not equivalent to ½ ?

a. 9/18 b. 11/22 c. 15/30 d. 16/32 e. 24/42

2. To express the fraction 30/48 in its lowest term, divide the numerator and demominator by

A. 2 B. 3 C.5 D. 6 E. 8

3.45 minutes , expressed as a fraction of one hour is

a. 1/60 b. 1/45 c. ¾ d. 4/5 e. 4/3

4. The missing number in the fraction 3 = ?

4 20 is

a. 6 b. 9 c. 12 d. 5 e. 15.

5. A woman bought 2 crates of eggs. ¼ of them are bad. How many of the eggs are good?  
 a. 3/6 b. 24 c. 48 d.12 e. 32.

**THEORY**

1.Find the missing numbers

1 = ? = ? = ? = 5

4 8 12 16 ?

(b) 2 = ? = ? = 8 = 10

5 10 15 ? ?

2. A drum holds 2 ½ litres of water when itsis ¾ full. How many litres of water can it hold when it is

(a) full, b, two-third (c)empty.

**WEEK SIX**

**TOPIC: FRACTIONS**

**CONTENT**

Ordering of Fractions

Percentages – Conversion

Conversion of Fractions to Decimals and Vice–versa.

**Ordering of Fractions**

It is much easier to compare the size of fractions, when they have the same denominator.

Example 1

Which is the larger fraction: 5/7 or 6/8?

Solution

= 5/7 or6/8

to have a common denominator

= 5/7 x 8/8 or6/8 x 7/7

= 40/56 or 42/56

hence 6/8 is larger than 5/7,

Examples

Which has the greater mass: 3054g or 3.56kg

Solution

= 3054g or 3.56kg

= 3054kg or 3.56kg

1000

= 3.054kg or 3.56kg

therefore, 3.56kg is greater than 3054kg

Examples

Which is the larger fraction in this pairs?

a. 3 21/50 or 3 31/60 b. 37/45 or19/24

Solution

a. 3 21/50 or 3 31/60

The whole number “3” can be ignored in the working . Consider the fractional part of the mixed fraction.

= 21/50 or 31/60

= 21/50 x 6/6 or 31/60 x 5/5

= 126/ 300 or 155/300.

Considering the values of the numerator 155 > 126

Therefore, 3 31/60 is larger than 3 21/50.

(b) 37/45 or19/24

= 37/45 x8/8 or 19/24 x 15/15

= 296/360 or285/360

Considering the values of their numerators,

296 > 285.

:. The fraction 37/45 is larger than 19/24.

Example

Arrange the following fractions in ascending order

1. 1/3 , 1/9, 5/18
2. 2/3, 5/6, 7/12, ¾

Solution

a. 1/3,  1/9, 5/18

= 1/3 x 6/6 =6/ 18

= 1/9 x2/2 = 2/ 18

= 15/18 x 1/1 =5/ 18.

Comparing their numerator, 2,5,6,

:. The fractions are

1/9, 5/18, 1/3.

(b) 2/3, 5/6, 7/12, 3/4/

= 2/3 =2/3 x 4/4 =8/ 12

= 5/6 =5/6 x2/2 = 10/12

= 7/12 =7/12 x 1/1 =7/ 12

¾ =3/4x 3/3  =9/12.

Comparing their numerators, 7,8,9 10.

The fractions are

7/12, 2/3, 3/6, 5/6.

**EVALUATION**

1. Which of the following fractions is larger?

a. 2/5 or 5/7 b. 5/6 or4/9

2. Arrange the following fractions in ascending order

3/5, 8/15, 17/30  (b) 3/5, 5/8, 7/10, 13/20.

**PERCENTAGES**

“Per cent’ means per hundred or ‘out of ‘hundred’ or ‘in every hundred’. For example, when we say a student obtained 63 percent in a test, what we mean is that he or she had 63 marks out of 100 marks this is usually written as 63%. Where the symbol % means per cent.

**a. Converting From percentage to fraction.**

Here, the given value in percentage is divided by 100.

A% = in fraction or A ÷ 100, A x 1/100.

Express the following as a fraction in its simplest form

i. 30% ii. 75% iii.7 ½ % iv. 13 ¾ %

Solution.

i. 30% = 30 = 3

100 10

ii. 75% = = ¾

iii. 7 ½ % = 15 = 3

100 x 2 40

iv. 13 ¾ % = 55 x 1 = 11

4 x 100 80

**b. Converting a percentage into a decimal**

To convert a percentage to a fraction divide the percentage by 100.

Examples

Change these to decimals

I 45% ii. 34 ¾ % iii. 5.8%

Solution

i.45% = 45/100 = 0.45

ii.34 ¾ %= 34.75/100 = 0.3475

iii.5.8% = 5.8/100 = 0.0058.

**c. Converting a fraction into percentage**

To convert a fraction into a percentage, multiply it by 100.

Examples

Express these fractions as percentages

i. ¼ ii.25/400 iii. 5/8

Solution

¼ = ¼ x 100% = 25%

ii. 125/400 = 125 x 100

400 = 125/4 = 31.25%

iii. 5/8 = 5/8 x 100 % =500/6 = 62.5%.

**d. Converting a decimal into a percentage.**

To change a decimal to a percentage multiply it by 100

Example.

Express the following as a percentage

a.0.75 b.0.045

Solution

a.0.75 =0.75 x 100 = 75

b. 0.048 =0.048 x 100 = 4.8%.

**e.Finding the percentage of a quantity**

To find the percentage of a quantity, express the percentage as a fraction, then multiply by the quantity.

Examples

i. 4.5% of N 248 ii. 205 of N250

Solution

i. 4.5% of N 248

= 4.5 x 248

100

=N1116/100 =N11.16.

ii. 20% of N250

= 20/100 x 250

=N50.

**f. Expressing one quantity as a percentage of another .**

To express one quantity as percentage of another write, the first quantity as fraction of the second and then multiply by 100.

Examples

i.8 students did not do their assignments in a class of 40.

a. What is this as a percentage?

b. What percentage of the class did their assignment?

Solution

a. Writing the first quantity as a fraction of the second gives 8/40.

Multiply the fraction by 100

Therefore, 8/40 x 100= 2 x 10 = 20%

20% of the student did not do their assignment .

c.Those who did their assignment were:

40 -8 = 32 students 32/40 x 100 = 32/ 4 x10 =80

80% did their assignments.

2.What percentage of N5 is 150 kobo?

Solution

Convert N5 to kobo first.

N5 = 5 x 100 = 500kobo

Expressing as a fraction , we have 150/500

Therefore, 150 x 100

501

the percentage is 30%

3.What percentage of 15km is 20,000cm?

Solution

Convert both quanities to same unit first

1 km = 100,000cm

15km = 100000 x 15 =1500 000cm

Expressing as a fraction 20000/1500 000

Then multiply by 100

20 000/1500 000 x 100 = 20/15 = 1.33%

**EVALUATION**

1. Calculate the following :

(a) 5% of N500 (b) 18% of 144km.

2. Convert the following fraction into decimal:

(a) 4/5 (b) 1 2/5

III.**Converting Fractions to Decimal**

To convert a fraction into decimal first re-write the number as a decimal then divide it by the denominator

Terminating decimal

When the denominator divides exactly into numerator a terminating decimal is obtained.

Example

Change ¾ into a terminating decimal number

Solution

0.75

4 30

25

20

20

¾ = 0.75.

Recurring or Repeating Decimals

Sometimes when changing fractions to decimal gives the same figure or group figures repeating themselves on and on. These types of fraction are called non-terminating decimals or recurring decimals.

Examples

Change the following into decimals :

(a) 4/9 (b) 6/11

Solution

a. 4/9 = 0.444

9 40

36

40

36

4

Therefore 4/9 = 0.444

= 0.4.

b. 6/11 0.545454

11 60

55

50

44

60

55

50

44

60

55

50

44

6

Therefore, 6/11 = 0.545454…..= 0.54.

Converting the following into fractions

i. 0.4 ii.0.067

Solution

i. 0.4 = 4/10 = 2/5

ii. 0.067 = 67/1000

(d) Addition and subtraction in decimal

Simplify the following :

i. 0.6 + 1. 7 ii. 0.59 – 0.55 iii. 7.5 + 1.8 iv.9.3 – 6.2

Solution

i.0.6 + 1.7

0.6

+1.7

2.3

ii. 0.59

- 0.55

0.44

iii. 7.5

+ 1.8

9.3

iv.9.3

- 6.2

3.1

**e. Multiplication and Division of Decimals**

examples

Simplify the following :

i. 0.08 x 0.7 ii. 0.5 x 7 iii. 0.18 ÷ 1.2

Solution

i. 0.08

x0.7

0.056

i. 0. 5

x 7

3.5

iii. 0.18 ÷ 6 = 0.03

iv. 1.56 ÷ 1.2

1.3

12 15.6

12

36

therefore, 1.56 ÷ 1.2 = 1.3

**EVALUATION**

Simplify the following :

i. 14.5 – 2.5 x 3.14

ii. 0.6 x 0.08

0.8

**WEEK SEVEN**

**TOPIC : ADDITION AND SUBTRACTION OF FRACTIONS**

**CONTENT**

i. Introduction

ii. Addition of Fractions

iii. Subtraction of Fractions

iv. Further Examples.

I. Introduction

Two or more fractions can be added or subtracted immediately if they both possess the same denominator, in which case we add or subtract the numerators and divide by the common denominator . For example

2/5 + 1/5 = 2 + 1 = 3/5

5

If they do not have the same denominator they must be rewritten in equivalent form so that they do have the same denominator – called the common denominator e.g

2/7 + 1/5 = 10/35 + 7/35 = 10 + 7 = 17

35 35.

The common denominator of the equivalent fraction is the LCM of the two original denominator that is,

2/7 + 1/5 = 5 x 2 + 7 x 1 = 10 + 7 = 10 + 7 = 17

5 x 7 7 x 5 35 35 35 35

From the explanation, the above example has its LCM = 35.

Can you try this,

5/8 + 1/6 ?

the correct answer is 19/24

Summary

If fractions have different denominators:

1. Find a common denominator by expressing each fractions as an equivalent fraction
2. Add or subtract their numerators.

**II. Addition of Fractions**

Example: Simplify the following fractions

(a) ¼ + ½ (b) 2/3 + 5/6 (c) 2/5 + ½ + ¼

Solution

a. ¼ + ½ = ¼ + 2 x 1 = ¼ + 2 = 1+ 2 = 3

2 x 2 4 4 4

(b) 2 + 5 = 2 x 2 + 5 = 4 + 5 = 4 + 5 = 9 = 1 3/6

3 6 3 x 2 6 6 6 6 6

= 1 ½ mixed fraction

(c ) 2 + ½ + ¼ = 2 x 4 + 1 x 10 + 1 x 5

5 5 x 4 2 x 10 4 x 5

= 8/20 |10/20 + 5/20 = 8 + 10 + 5 = 23/24 = 1 3/20

20.

Example 2:Simplify the following fractions.

1. 1 ¾ + 2 2/3 + ½
2. 3 ¾ + 5/8 1 7/12
3. 5 4/9 +7 1/3 + 1/12

Solution.

1 ¾ + 2 2/3 + ½

convert to improper fractions

7/4 +8/3 + ½

7 x 3 + 8 x 4 + 1 x 6

4 x 3 3x 4 2 x 6

21/12 + 32/12 + 6/12

= 21+ 32 + 6

12

= 59/ 12

4 11/12

b. 3 ¾ + 5/8 + 1 7/12

convert to improper fractions

15/4 + 5/ 8 +19/ 12

15 x 6 + 5 x 3 + 19 x 2

4 x 6 8 x 3 12 x 12

= 90/24 +15/ 24 + 38/24

= 90 + 15 + 38

24

143

24

5 23/24

c. 5 4/9 +7 1/3 + 1/12

convert to improper fractions

49/9 + 22/2 + 1/12

= 49 x 4 + 22 x 12 + 1 x 3

9 x 4 3 x 12 12 x 3

196/36 +264/36 + 3/36

196 + 264 + 3

36

463

36

= 12

**EVALUATION**

Simplify the following:

a. 3 7/8 + 2 3/4

b. 1 ½ + 2 1/3 + 3 ¼

c. 5 + 1 ¾ + 2 2/3

III. **Subtraction of Fractions**

Example 1: simplify the following:

a. 2/3 – ¼ b. ¾ - 5/8 c. 5 ¾ - 2 4/5

Solution

2/3 – ¼

= 2 x 4 - 1 x 3

3 x 4 4 x 3

= 8 - 3

12 12

8 – 3

12

5

12.

b. ¾ - 5/8

3 x 2 - 5

4 x 2 8

6 - 5

8 8

6 – 5

8

1

8

c. 5 ¾ - 2 4/5

convert to improper fraction,

23/4 -14/5 = 23 x 5 - 14 x 4

4 x 5 5 x 4

= 115 -56

20 20

= 115 – 56

20

59

20 = 2 19/20.

Example 2: simplify the following :

a. 5 1/6 - 3 2/3 + 6 7/12

b. 2 ½ + 3 + 7/10 – 2/5 - 2

c. 2 ½ + ¾ - 11/6 + 4 – 1 2/3

Solution

a. 51/6 – 3 2/3 + 6 7/12

= 31/6 -11/3 + 79/12

= 31 x 2 - 11 x 14 + 79

6 x 2 3 x 4 12

62/12 -44/12 + 79/12

= 62 – 44 + 79

12

97

12 = 8 1/12

b. 2 ½ + 3 + 7/10 – 2/5 – 2

= 5/2 – 3/1 +7/10 – 2/5 – 2/1

5 x 5 - 3 x 10 + 7 - 2 x 2 – 2 x 10

2 x 5 1 x10 10 5 x 2 1x 10

25- 30+ 7 - 4 - 20

10 10 10 10 10

= 25 – 30 + 7 – 4 – 20

10

= 25 + 7 – 30 – 4 -20

10

= 32 – 30 – 4 – 20

10

= -22

10

2 2/10 = - 2 1/5

c. 2 ½ + ¾ - 1 1/6 + 4 – 1 2/3

5/2 + ¾ -7/6 +4/1 – 5/3

5 x 6 +3x 3 - 7 x 2 + 4 x 12 - 5 x 4

2 x 6 4 x 3 6 x 2 1x12 3 x 4

30 + 9 - 14 + 48 - 20

12 12 12 12 12

30+99 – 14 + 48 – 20

12

30 + 9- 14 + 48 – 20

12

30 +9 + 48 – 14 – 20

12

87 – 34

12

53/12

4 5/12

**EVALUATION**

Simplify the following :

1. 2 ½ - 1 4/5 + 2 3/2 - 1

2.7 ½ + 3 1/6 – 3 ¼

3.14 4/15 – 4 2/3 + 7 1/5

III. Further examples

Example 1

What is the sum of 2 ¾ and 2 4/5?

Solution

Sum = addition 9 + 0

Hence, sum of 2 ¾ and 2 4/5 is

= 2 ¾ + 2 45

11+ 14

4 5

11 x 5 + 14 x 4

4 x 5 5 x 4

= 55 + 56

20 20

55 + 56

20

111

20 = 5 11/20

Example 2

A 2 ¼ kg piece of meat is cut from a meat that weighs 3 2/5kg. What is the weight of the meat left?

Solution

Original weights of meat = 2 2/5kg

Weight of meat cut = 2 ¼ kg

Final weight of meat = 3 2/5 - 2 ¼

= 17/5 - 9/4

= 17 x 4 - 9 x 5

5 x 4 4 x 5

68 - 45

20 20.

68 – 45

20

23

* 1. = 2 3/20

The weight of the meat left = 2 3/20 kg.

Example 3

A fruit grower uses 1/3 of his land for bananas, 3/8 for pineapples, 1/6 for mangoes and the remainder for oranges. What fraction of his land is used for oranges.

Solution.

The entire land is a unit = 1

Every other fractions add up to give 1

;.oranges + bananas + pineapple + mango = 1

:. Orange = 1 - ( 1/3 + 3/8 + 1/6)

= 1 – ( 1 x 8 + 3 x 3 + 1 x 4 )

3 x 8 8 x 3 6 x 4

= 1 – ( 8/4 + 9/24 + 4/24 )

= 1 – 8 (8 + 9 + 4 )

24

1/1 - 21/24

= 24 – 21

24

= 3/24 = 1/8.

:. The fruit grower used 1/8 for oranges.

**EVALUATION**

1. By how much is the sum of 2 4/5 and 4 ½ less than 8 1/10?

2. A boy plays football for 13/4 hours, listens to radio for ¾ hours and then spends 1 ¼ hours doing his homework. How much time does he spend altogether doing these things?

**WEEKEND ASSIGNMENT**

1. Simplify 2 ½ + ¼

(a) 3 ¾ (b).2 1/8 (c) 1 ¾ (d) 2 ¾.

2. Simplify 4 2/5 – 3 ¼

(a) 1 3/20 (b) 3 2/5 (c) 1 7/20 (d) 1 5/8

3. The common denominator of the fractions is

(a) 8 (b) 12 (c ) 6 (d) 15

4. Simplify

(a) 1 43/45 (b) 43/45 (c) 2 37/45 1 41/45

5. What is the sum of 1 ¾, 2 3/5 and 5 ¾

(a0 3 1/30 (b) 5 1/60 (c) 7 1/60 (d) 8 1/50.

**THEORY**

1. Simplify the following;

( a) 37/8 + 2 ¾ (b) 2 56 + 5 7/8

(c)

2. Mr. Hope spends 1/3 of his earnings on food and ¼ on clothes. He then saves the rest. What fraction does he

(a) spend altogether

(b) save?

**WEEK NINE**

**TOPIC : MULTIPLICATION AND DIVISION**

1. Simple Examples on Multiplication and Division of Fractions
2. Harder Examples
3. Word Problems.
4. Prime Numbers and Fractions

Introduction

Multiplication of fractions is simply a direct method compared to division of fractions. In multiplication, there is direct multiplication of the numerator of one fraction with the other and the denominator with the other.

Division is usually technical as there is reversal of the sign ( ÷) to multiplication sign 9x ) thereby leading to the reciprocal of the right-hand value.

A x x = A x α

B y B x y

But A ÷ x = A x y = Ay

B y B x Bx.

BODMAS

When signs are combined as a result of combination of fractons, it is therefore important to apply some rules that will enable us know where to start from. Such guide is BODMAS. It states that when there is combination of signs, they should be taken in order of their arrangement

B= bracket

O= of

D= division

M= multiplication

A= addition

S= subtraction.

Simple example

Example 1

Simplify the following;

(a) 1 3/5 x 6 (b) 4/11 of 3 2/3

(c) 3 ¾ x4/9 x 1 1/5 (d) 12/25 of (1 ¼ )2

Solution

(a) 1 3/5 x 6 (b) 4/11 of 3 2/3

= 8/5 x 6 = 4/11 x 11/3

= 8 x 6 = 4/3

5 x 1 = 1 1/3

= 48

5

= 9 3/5

c. 3 ¾ x 4/9 x 1 1/5 (d) 12/25 of ( 1 ¼ ) 2

15/4 x 4/9 x 6/5 12/25 x 5/4

15 x 6 = 12/25 x 5/4 x 5/4 =12/16 = 2

9 x 5

Example 2

Simplify (a) 7 1/5 ÷ 25 (b) 12/25 ÷9/ 10

(c) 7 7/8 ÷ 6 5/12

Solution.

(a) 7 1/5 ÷ 25 (c ) 7 7/8 ÷ 6 5/12

= 36/5 ÷ 25/1 = 63/8 ÷ 77/12

= 36/5 x 1/25 = 63/8 x12/77

= 36/125

b. 12/2 ÷ 9/10 = 9 x 3

12/25 x 10/9 2 x 11

4 x 2 = 27/22

5 x 3 = 1 5/22

= 8/15.

Example 3

Simplify

(a) 3/10 x 35/36 (b) 5 ¼ ÷ 2 /5

14/15 3 ¾

= 7 x 1 21/4 ÷ /5

2 x 12 15/4

7/24 ÷14/15 =21/4 x 5/14

15/14

7/24 x 15/14 = 15/8

15/4

= 15 = 15/8 ÷ 15/4

24 x 2

= 5 = 15 x 4

8 x 2 8 15

= 5 = 4

16 8 = ½

5/16.

**EVALUATION**

Simplify the following ;

1. 8 1/6 X 3 3/7

11 2/3

2. 7 3/7÷ 5/21

9 ¾ x 2/3

More examples

Example I

Simplify the following fractions

a. 5/8 x 1 3/5 b. ¾ of 3 3/7 c. 9/16 ÷3 3/8

Solution

5/8 x 1 3/5 b ¾ of 3 3/7

5/8 x 8/5 =3/4 x 24/7

5 x 8 = 3 x 24

8 x 5 4 x 7

= 1 3 x 6

7 = 18/7 = 2 4/7

c.9/16 ÷ 3 3/8

9/16 ÷ 27/8

9/16 x18/27 = 6/16 = 3/8.

Example 2.

Simplify 2 4/9 x 1 7/8 ÷ 2 1/5

Solution

2 4/9 x 1 7/8 ÷ 2 1/5

= 22/9 x 15/8 ÷ 11/5

BODMAS: application

= 22/9 x 15/8 x 15/11

5 x 5

3 x 4

= 25/12

= 2 1/12.

Example 3

Simplify 3 ¾ ÷ ( 2 1/7 of 11 2/3 – 5)

Solution

3 ¾ ÷ ( 2 1/7 of 11 2/3 – 5)

BODMAS – application ( the bracket first0

= 3 ¾ ÷ ( 15/7 of 35/5 – 5)

3 ¾ ÷ (15/7 x 35/3 – 5/1)

see BODMAS also multiplication first

3 3/3 ÷ ( 5 x 5 – 5)

15/4 ÷ ( 25 – 5)

15/4 ÷ 20/1

= 3

4 x 4

3

1 6

**EVALUATION**

Simplify the following

1. 9 ¾ - 1/3 ) x 4 1/3 ÷ 3 ¼
2. ( 2 ¾) 2 ÷( 3 1/3 of 2 ¾ )

**III. Word problems**

Example I

What is the area of a rectangle of length 12 2/3m and breadth 7 ¼ m?

Solution

7 ¼ m

12 2/3m

Area of rectangle, A = L x B

L = 12 2/3m, B= 7 ¼

Area = 12 2/3 x 7 ¼

Area = 28/3 x 29/4

Area = 19 x 29

6

Area = 551

6

Area = 91 5/6m2

Example 2

Divide the difference between 4 1/5 and 2 2/3 by 1 2/5.

Solution

Interpreting the question

= 4 1/5 – 2 2/3

1 2/5

= ( 21/5 - 8/3 ) ÷ 1 2/5

( 21/5 x 3/3 – 8/3 x 5/5 ) ÷ 1 2/5

( 63/15 - 40/15) ÷ 7/5

( 63 – 40 ) ÷7/5

15

23/15 ÷ 7/5

23/15 x 5/7

23/21

= 1 2/21

Example 3

What is three-quarters of 3 3/7 ?

Solution

= three-quarter = ¾

= ¾ of 3 3/7

= ¾ x 24/7

= 3/1 x 24/7

3/1 x 6/7.

Example 4

In a game, 9/10 play sports. 2/3 of these play tennis. What fraction of the students play tennis.

Solution

Fraction who play sports = 9/10

Fraction that play tennis = 2/3 of 9/10.

2/3 x 9/10

1 x3

5

=3/5.

:.3/5 of the students play tennis.

Example 5

Three sisters share some money. The oldest gets 5/11 of the money. The next girl gets 7/12 of the remainder. What fraction of the money does the youngest girl get?

Solution

Let the total money; be a unit = 1

1st girl gets = 5/11 of 1 = 5/11

remainder = 1 -5/11 = 11 – 5 = 6/11

11

2nd girl gets = 7/12 of the remainder

=7/12 of 6/11

= 7/12x 6/11 = 7/22

3rd girl will get 6/11 – 7/22

= 6/11 x 2/2 – 7/22

= 12/22 – 7/22

= 12 – 7

22

=

:.the fraction of the money that the youngest girl will get =

**EVALUATION**

1. A boy eats ¼ of a loaf at breakfast and 5/8 of it for lunch. What fraction of the loaf is left?
2. In a class of 4/5 of the students have mathematics instrument . ¼ of these students have lost their protractors. What fraction of students in the class has protractors?

**IV. PRIME NUMBERS**

A prime number is a number that has only two factors, itself and 1. Some examples are 2,3,5,7,11,13,…

1 is not a prime number because it has only one factor, that is, itself unlike 2 which has itself and 1 as its factors. All prime numbers are odd numbers except 2 which is an even number.

Example 1

Write out all prime numbers between I and 30

Solution

Between 1 and 30.

Prime numbers = 2,3,5,7,119………..

1 is not a prime number because it has only one factor, that is, itself unlike 2 which has itself and 1 as its factors. All prime numbers are odd numbers except 2 which is an even number.

Example 1

Write out all prime numbers between I and 30

Solution

Between 1 and 30.

Prime numbers = 2,3,5,7,11, 13, 17,19,23,29.

II. Factors

A factor of a given number is a number which divides the given number without leaving any remainder. For instance, 10÷ 2 = 5 without a remainder, therefore, we say 5 is a factor of 10. Thus, we say that 3 is not a factor of 10.

Example 1

Find the factors of 32

Solution

32 = 1 x 32 =2 x 16 =4x 8

= 8 x 4 = 16 x 2 = 32 x 1

:. Factors of 32 = 1, 2,4,8, 16, and 32 or

Using table

32 1 x 32

2 x 16

4 x 8

Factors of 32 = 1, 2,4,8, 16 and 32

Note; A case were you have a particular number occurring two times, duplication is not allowed. Pick it once. See the example below;

Example 2

Find the factors of 144

Solution

144 1 x 144

144 2 x 72

144 3 x 48

144 4 x 36

144 6 x 24

144 8 x 18

144 9x 16

144 2 x 12

Factors of 144 = 1,2,3,4,6, 8,9,12,16, 18, 24, 36, 48, 72 and 144

from the example, 12 occurred twice, but only one was picked.

Example 3

Find the factors of 120

Solution

120 1 x 120

1. 2 x 60

120 3 x 40

120 4 x 30

120 5 x 24

120 6x 20

120 8 x15

120 10 x 12

Factors of 120 = 1,2,3,4,5,6,8, 10,12,15,20,24,30,40,60 and 120.

Prime Factors:

From our definition of prime numbers, it will be easy joining factor to it and getting the meaning of prime factors.

Prime factors of a number are the factors of the number that are prime.

To find the prime factors of a number.

1.Start by dividing the number with the lowest number that is its factor and progress in that order.

2. If you divide with a particular number, check if it can divide the new number again before moving to the next prime number.

Example 1

Express the following whole numbers as product of prime factors.

(a) 12 (b) 18 (c) 880 (d) 875.

Solution

1. 12 2 18
2. 6 3 9

2 2 3 3

1 1

12 is expressed as a product of 18 = 2 x 3 x 3

primes.

12 = 2 x 2 x 3

( c ) 2 880 5 875

2 440 5 175

2 220 5 35

2 110 7 7

5 55

11 11 875 =5 x 5x 5 x 7

1

= 880 = 2 x 2 x 2 x 2 x 5 x 11

example 2

Express 1512 as a product of prime factors.

Solution

Following the example above

2 1512

1. 756
2. 378
3. 189
4. 63
5. 21

7 27

1512 = 2 x 2 x 2 x3 x 3 x 3 x 7

**EVALUATION**

Express the following as product of prime numbers

1. 108
2. 216
3. 800
4. 900
5. 17325

Index Form

If we have to write the following 4, 18, 16 as a product of prime factors, it will pose no challenge

4 = 2 x 2

8 = 2 x 2 x 2

16 = 2 x 2 x 2 x 2

As their products increase, the challenge of how to write 2 or whichever number is multiplying itself will arise.

A way of writing this in a shorter form is called index form.

The general form is xn

Where x = the base, that is the multiplicative value and

n=index or power or the number of times a particular number multiplies itself.

Example 1

Express the following index

1. 3 x 3 x 3 x 3
2. 5 x 5 x 5
3. 2 x 2 x 2 x 2 x 2 x 2 x 2

Solution

(a) 3 x 3 x 3 x 3, this shows that four 3’s are to be multiplied together.

Writing index form

= X n

x = 3, n = 4

:. 3 4

(b) 5 x 5 x 5 = three 5’s in general form Xn

= x =5, n = 3

= 5 3

(c) 2 x 2 x2 x 2 x 2 x 2 x 2

= seven 2’s

= X n.

x = 2, n =7

= 2 7

As product of primes

800 …… 2 x 2 x 2 x 2 x 2 x 5 x 5

800 = 25 . 52

example 3

Express the following as a product of primes in index form.

(a) 720 (b) 1404

(a) 720 (d) 1404

2 720 2 1404

2 360 2 702

2 180 3 351

2 90 3 117

3 45 3 39

3 15 3 13

5 5 13 1

720 = 2 x 2 x2 x 2 x3 x 2 x 5 1404 = 2 x 2 x 3 x 3 x3 x 13

= 24x 32 x 5 = 22 x33 x 13

**WEEKEND ASSIGNMENT**

1.The fractions C/D ÷ a/b is same as

(a) Ca/Db (b) Cb/Da (c ) C x a (d) a x C (e) a x b

D x b b x D D x b

2. Simplify 11/25 x 1 4/11

(a) 2/3 (b) 3/5 (c) 2/5 (d) 4/5 (e) 1 ¼

3.Find the length of a rectangle whose breadth and area are 7/20m and 8 1/5m2

(a) 23 3/7 (b) no answer ( c) 21 2/7 (d) 1 7/20 (e) 8 11/20.

4. Simplify 5 ¼ + 1 1/6 – 3 2/3

(a) 5 11/4 (b) 2 ¾ ( c) 3 1/12 (d) 1 ¾ ( e) 3 - 3/2

5. The product of prime factor of 28 is

(a) 2 x 3 x 7 (b) 2 x 4 x 7 (c ) 4 x 7 (d) 2 x 2 x 7 (e) 2 x 2 x2 x 7.

**THEORY**

1. Simplify 2 2/5 – 1 ¾

4/5 + ½

2. Express the following as a product of prime factors; i. 105 ii. 75 iii. 60.

**WEEK TEN**

**TOPIC: ESTIMATION**

**CONTENT**

Rounding Off Numbers

Dimensions ,Distances, Capacity and Mass

**Costing**

Rounding off Number

Estimation involves making educated guesses about the approximate values of measurements such as distance, weight, price, or capacity, without the need for precise measurements or calculations. While not entirely precise, estimation provides a reasonable approximation of the correct answer.

Estimation aids us in obtaining a rough idea of the result when performing operations like addition, subtraction, multiplication, or division with given quantities. This process often involves rounding off numbers and making approximations to facilitate estimation.

B. **Rounding Off Number**

Example;

1, Round 1234 to the nearest 10

II. Round 1834 to the nearest hundred

III. Round these numbers to the nearest thousands

1. 3512 (b) 4265

Solution to the examples:

i. 1234 = 1230 to the nearest ten

ii. 1834 = 1800 to the nearest hundred

iii. 3512 = 4000 to the nearest thousand

iv. 4265 = 4000 to the nearest thousand.

2. Rounding Off Numbers to a Specific number of Decimal Places

Examples

Give 474.4547 correct to the nearest hundredth and thousandth

Solution to the example.

474.447 = 474.45 to the nearest tenth

=474.45 to the nearest hundredth

=474.455 to the nearest thousandth.

**3. Rounding Decimal number to the Nearest Whole Number.**

Examples

Round ( I ) 13.73 (ii)34.245 to the nearest whole number

Solution.

i. 13.73 = 14 to the nearest whole number

ii. 34.245 = 34 to the nearest whole number.

**3 Significant Figure**: The term "significant" denotes importance and serves as another approach to approximate numbers. It refers to a digit's position within a number, indicating its value.

It's important to note that the first significant digit in a number is always the first non-zero digit when reading the number from left to right. Additionally, zeros positioned in the middle of a number are considered significant. Zeros that appear before or at the end of other digits are also deemed significant.

Measurements and currency values are typically expressed with a specific number of significant figures, reflecting the precision and accuracy of the data being conveyed

Examples.

i. Give 5754 correct to

(a) 1. s.f (ii) 2. s.f (iii) 3. s.f.

ii. Give 147 .006 to

(a)1 s.f (ii) 2 s.f. (iii) 3. s.f. (iv) 4 s.f (e) 5 s.f

iii. Give 0.007025 to

(i) 1 s.f (ii)2 s.f (iii) 3.s.f (d) 4 s.f

iv. Give 0.0007004

(a) 2.s.f (b) 2.s.f.

Solution to the examples

i. 5754 = 60000 to 1 s.f

= 5800 to 2 sf

=5750 to 3s.f

ii. 147.006

= 100 correct to 1 s.f

= 150 correct to 2 s.f

=147 correct to 3s.f

= 147.0 correct 4 s.f

= 147.01 correct to 5 s.f

ii. 0.007025

= 0.007 correct to 1 s.f

=0.0070 correct to 2 s.f

= 0.00702 correct to 3 s.f

0.007025 correct to 4 s.f

iv.0.0007004

=0.00070 correct to 2 s.f

=0.000700 correct to 3 s.f

remember that the zeros at the end are necessary to show the number of significant figures.

**EVALUATION**

1. Read off to nearest ten (i) 95 (ii) 127

2. Give 3.9998 to (i) 1 s.f (ii) 2 s.f

Solution to evaluationquestions

1.i. 95 = 100 correct to nearest ten

ii. 127 = 13 correct to nearest ten

2. i. 4 = ( s.f)

ii. 4.0 ( s.f)

II. **Dimension and Distances, Capacity and Mass**

The common units of length(i.e km, m,cm, mm) mass (i.etonne, kg. g ) capacity (i.e cl.ml) and time (hour, min. seconds ) are widely used. The most common unit for length are millimeter(mm) centimeter (cm). Meter(m) and centimeter for short length and the higher units (meter and kilometer) for larger distances.

The common units of mass are the gramme(g), kilogramme kg and tone (t). The common units of capacity and the milliliter (ml) centiliter (cl) and litre (l) as unit length, we use the lower units for smaller quantities.

It is important to be able to choose the most appropriate meter units of measurement to use. For example to measure distance less than a metre,smaller such as millimeter (mm) and centimeters are used. To measure a large distance metres (m) a kilometers (km) are used.

For example;

i. to measure the distance between Lagos and Benin City, we use km.

ii. to measure the height of a man, we use meters and centimeter.

iii. to measure the time it will take to run 200m, we use seconds etc.

Examples

1.State the metric units at length you would use to measure the following;

(a) length of your classroom (b) length of your fingernail

2. State the appropriate metric units of mass (weight) you would use to measure the following;

(a) your weight (b) the weight of a diary.

3. State the appropriate metric unit capacity you would use to measure the following;

a. the amount of water in a glass cup b. the amount of medicine in a tea spoon

4. State the appropriate metric unit of time you would use to estimate the following :

a . the time it takes a sportman to run 100m b. the time it takes to walk or travel to your school.

Solution to the examples.

1. (a) m (b)mm

2. (a) kg (b) g

3. (a) ml (b) ml

4. (a) second (b) min.

**EVALUATION**

1. State the units of length you would use to measure the following:

(a) height of a desk (b) height of yourself

2. State the units of mass you would use to measure the mass of the following

(a) a parcel (b) a large land

3. State the units of capacity you would use to measure the capacity of the following ;

(a) cup (b) car petrol tank (c)a tin of peak milk (d) the amount of water in a reservoir

4. State the appropriate metric units of time you would use to measure the following:

a time it takes to fill an empty tank b. the time it takes to travel from Lagos to Ado Ekiti.

Solution

1. a. cm b. cm

2. a. g or kg b. t

3. a. ml b. liter c. ml d. ml

4. a. min b. hour.

**Costing:**

It is important to know the prices of items or goods in your area. This will enable you know the best place to buy a particular item at a reasonable price. In general, the more you buy the more you must pay.

Examples.

1.James bought 5 exercise books at a bookshop at N50.50 each> How much did he spend.

Solution

1. 1 exercise book cost = N50.50

therefore 5 exercise books will cost N50.50 x 5 = N225.50.

That means he spent N252.25

2. one candle cost 19C. Calculate the cost of five candles.

Solution

1 candle cost 19C

therefore 5 candles will cost 19C x 5 =95C

3. Find the cost of three tins of margarine at N48.00per tin

Solution

1 tin costs N48.00

Therefore 3 tins will cost N48.000 x 3 = N144.00

**EVALUATION**

1. Eggs cost N6.00 each. How much will one dozen of eggs cost?

2. 30 mangoes cost N150. What would be the cost of N140 similar margarine/

Solution

1 egg cost 12 eggs will cos N6.00

1 dozen (12) eggs will cost N6.00 x 12 eggs = N72.00

one dozen = N72.00

2. 30 mangoes cost N150.00

therefore 1 mango will cost 150.00/30 mangoes =N5

therefore 140 similar mangoes will cost N5 x 140 = N700.00

140 mangoes will cost N700.00

**WEEKEND ASSIGNMENT**

1. Round 567 to the nearest hundred

(a)500 (b)520 (c )540 (d) 580 (e) 600

2. What is 1.99961 correct to 2 d.p

(a) 1.99 (b) 2.00 (c ) 3.00 (d) 4.00 (e) 5.00

3. Write 7.0149 correct to the nearest thousandth

(a) 7.000 (b)7.014 (c ) 7.015 (d) 7.0145 (e) 7.0146

4. Give 0.000057891 to 4 s.f.

(a)0.00005789 (b)0.00005790 (c) 0.00005781 (d)0.000057892 (e)0.00005793.

5. Give 45698 correct to 3 s.f.

(a) 45600 (b)45700 (c )45800 (d)45690 (e) 45000.

**THEORY**

1. A sack of rice holds 64 basins of rice. How much will a woman get if she sells each basin of rice for N48.50.

2.Calculate the total cost of the following :

i. 3 textbooks at N400.00 each

ii.9 mathematical set at N2500.50

iii. 3 pens at 120.25 each

iv. 5 pencils at N20.00 each.