P.5 MATHEMATICS LESSON NOTES FOR TERM I 2020

Theme: **Sets**

Topic: **Set concepts**

Sub topic: **Types of sets**

Competences

Subject

The learner;

- Defines what a set is
- States the types of sets
- Defines the types of sets

Language

The learner;

Reads, pronounces and writes words correctly such as

- Set
- Equivalent
- Empty set e.t.c.

CONTENT

What is a set?

It is a collection of well defined objects.

There are different types of sets e.g.

- Equal sets
- Equivalent sets
- Empty sets
- Disjoint sets

What are equal sets?

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

Example

If A = (a, e, i, o, u) and B = (e, i, o, u, a)

Set A = B

What are equivalent sets?

These are sets with the same number of elements but of different kind.

Example

If A = (a,e,i,o,u) and B =*1,2,3,4,5) then set A is equivalent to set B.

Set A↔B

Empty sets

These are sets without any member in them, symbol used $\{\ \}$ or $\emptyset$

Example

Set P (bulls which produce milk).

P = $\{\ \}$

Disjoint sets

If two sets have no members in common, they are called disjoint sets.

X = (a,b,c,d,e) and Y = (x,y,z)

X and Y are disjoint sets

Activity

1. Use the following sets to answer questions

   A= (a,b,c,d,e,e,f), B= (1,2,3,4,5,6) C=(a,e,i,o,u)

   D= (u,o,i,e,a) E = (s, t, u)

Fill in true or false

a) A and B are equal sets _____

b) A and E are disjoint sets_____

c) A and C are Equivalent sets_____

d) A and B are Equivalent sets_____

2. In the following, state whether the sets below arte empty or not empty

e) F = (daughters who are as old as their mother)

f) C = (a car which can fly like a helicopter)

g) P = (women who have been vice presidents in Uganda)

Topic: **Set concepts**

Sub topic: **Intersection of sets**

Competences

Language competences

The learner;

- Reads, pronounces and writes words such as set region.

CONTENT

Intersection of sets

Symbol for intersection is "$\cap$"

Inter section means elements that are shared in two or more sets

Example

If set M (a, e, i, o, u) and N = a b, c, d, e, f, g, h, i, j)

Find

i) MnN

ii) n(MnN)

i) M n N = (a, e, i)

ii) n (M n N)

M n N = (a , e, i)

N (M n N) = 3 elements

Activity

Find the intersection of the following sets

1. A = (a,b,c) B= (b, d,e,f)
2. P=(a,e,i,o,u) Q=(a,b,c,d,e,f)
3. M=(1,2,3,4,5) N=(3,4,7)
4. L = (0,1,4,6,8) K=(6,8,7,5)
5. T= (4,5,6,7,8) K=(7,2,4)

Theme : Sets

Topic : St concepts

Subtopic : Listing member in intersecting sets

Competences

The learner;

Reads, pronounces and writs words such as

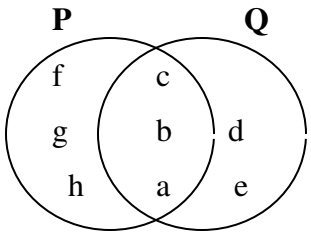
- Listing
- Intersecting etc.

CONTENT

Listing members in intersecting sets

Examples

1. List members for P, Q and PnQ

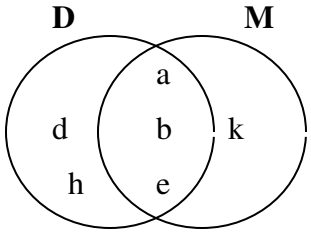


P = (a,b,c, g, h, f)

Q = (a, b, c, d, e)

P n Q = (a, b, c)

2. List members for D, M, MnD



D = (a,b,c , d, e)

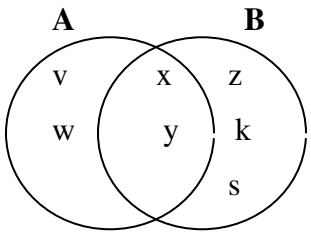
M = (a, b, e, k)

D n M = (a, b, e)

Activity

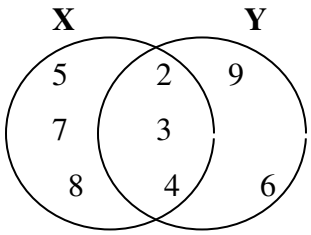
List the members of the sets given in the diagrams below.

a)



i) A ii) B iii) AnB

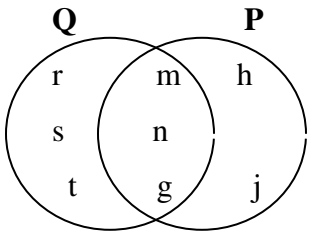
b)



i) X ii) Y iii) XnY

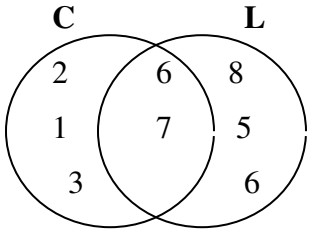
 For More of the same work visit my website at https://emmaug.com

c)



i) Q ii) P iii) Q n P

d)



xi) C ii) L iii) C n L

Theme : Sets

Topic : Set concepts

Subtopic : Union of sets

Competences

The learner;

Reads, writes and pronounces words such as

- Union
- Set

Subject

The learner;

- Defines the meaning of union of sets
- States the symbol used

Theme : Sets

Topic : Set concepts

Subtopic : Union of sets

Competences

Language

The learner;

Reads, pronounces and writes words such as set

- Region
- Union

Subject

The learner;

- Defines union of sets
- States the symbol for union
- Lists and finds number of elements

CONTENT

Union of sets

Union of sets is a collection of all elements in two or more sets.

Symbol used is "∪"

Examples

1. Given that set P =(bananas, potatoes, maize) Q = (posho, maize, peas)

   Find;

i) P u Q

ii) n(P u Q)

i) P u Q = (Bananas, potatoes, posho, maize, peas)

ii) n(P u Q) =

P u Q = (Bananas, potatoes, posho, maize, peas)

n(P u Q) = 5

2. If A = (chair , tables, stools) B = (books, pens , stools)
   a) List elements in set A u B
   b) Find number of elements in set A u B
   a) A u B = (chairs, tables, stools, books, pens)
   b) n(A u B)

   A u B = (chairs, tables, stools, books, pens)

   n(A u B) = 5

Activity

List and find the number of elements in the union sets.

1. A = (oranges, mangos, pawpaws)

   B = (tomatoes, peas, pineapples)

2. P = (Mugu, Akello, Abudul)

   Q = (Twine, Aguti, Magezi)

 For More of the same work visit my website at https://emmaug.com

3. M = (book, pen, bottle)
   N = (cups, spoon, bottle)

4. R = (paper, pen, ink, pot)
   S = (paper, ruler, pencil)

5. A = (2, 4, 5,)
   B = (1,2,4,6)

Theme : Sets

Topic : Set concepts

Sub topic : Representing intersection and union on diagrams

Competences :

Language

The learner;

Reads , pronounces and writes words such as

- Representing
- Intersecting
- Venn
- Diagram

Subject

The learner;

- Interprets then question given
- Lists elements in the intersection set
- Finds the number of elements

CONTEN

Representing intersection and union on venn diagrams.

Example

1. Given that set M = (matooke, maize, millet, sorghum)
   N= (cabbage, matooke, onions, tomatoes, egg plant)

a) Represent the above information on the venn diagram.

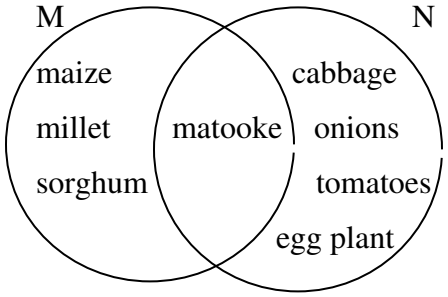
b) Find

a. MnN

b. MuN

c. N(MnN)

d. N(MuN)



b) i) MuN = (matooke)

ii) M u N = (maize, millet, sorghum, matooke,cabbage, onions, tomatoes, eggplant)

iii) n(MuN)=1

iii) n(MuN)

Activity

a) Draw venn diagrams to represent intersection and union of sets

b) Find the number of elements in the union and intersection

1. Given that

A = (sweets, bread, biscuits)

B = (sodas, biscuits, juice)

2. If K = (Akello, Okum, Batte)

J = (Okum, Musa, Otti)

3. Given that;

L = (hat, cap, helmet)

H = (shirt, trouser, helment)

4. If A = (1,2,3,4,5,6)

B = (1,4,9,16,25)

5. If R = (9,2,4,6,8)
   S = (4, 3, 5, 7, 9)

Theme : Sets

Topic : Set concepts

Sub topic : Finding difference of sets

Competences

Language

The learner;

Reads, pronounces and writes words such as

- Differences
- Region

Subject

The learner;

- Interprets the question given
- Defines the word difference
- Lists elements
- Finds number of elements

CONTENT

Finding difference of sets

1. Given that set M = (a , e, i, o, u) and N = (a, b, c, d, e, f)
   Find
   i) M – N
   ii) N – M
   iii) n(M – N)
   iv) n(N – M)

   i) M – N = (i, o, u)
   ii) N – M = (b,c,d,f)
   iii) n(M – N) = 3
   iv) n (N – M) = 4

2. If set Y = (1, 2, 3, 4, 5, 6, 7, 8,) and X = (6, 9, 11, 12, 13, 14, 15)

Find

i) X – Y

ii) Y – X

iii) n(X – Y)

iv) n(Y – X)

i) X – Y = (9, 11, 12, 13, 14, 15)

ii) Y – X = (1, 2, 3, 4, 5, 7, 8)

iii) n(X – Y) = 6

iv) n (Y – X) = 7

Activity

1. Given that set Z = (maize, sorghum, millet, Rice) and
   set Y = (sorghum, eggplant, tomatoes)

Find

i) Z – Y

ii) Y – Z

iii) n(Z – Y)

iv) n(Y – Z)

2. If set T = (1,2,3,4,5,6,7) and set D = (2,5,9,10)

Find

i) T – D

ii) D – T

iii) n(T – D)

iv) n(D – T)

Theme : Sets

Topic : Set concepts

Subtopic : More about intersection, union and difference of sets

Competences

Language

The learner;

Reads, pronounces and writes words such as;

- Intersection
- Union
- Difference

Subject

The learner;

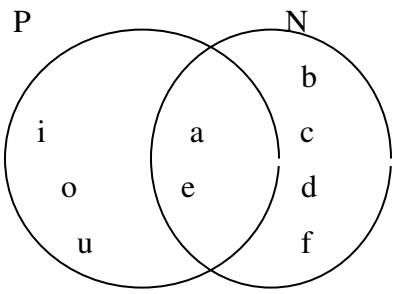
- Interprets the question given
- Represents the information on the venn diagram
- Finds the union, intersection and differences
- Finds the number of elements

Content

More about intersection, union and difference of sets

Examples

1. Given that set P = (a, e, i, o, u) and N = (a, b, c, d, e, f)
    a. Represent the above information on the venn diagram
    b. Find
        i) $P \cap N$
        ii) $P \cup N$
        iii) $P - N$
        iv) $N - P$
        v) $\cap (P \cap N)$
        vi) $\cap (P \cup N)$
        vii) $\cap (P - N)$
        viii) $\cap (N - P)$



b)

i) $P \cap N = (a, e)$

ii) $P \cup N = (a, b, c, d, e, f, i, o, u)$

iii) $P - N = (i, o, u)$

iv) $N - P = b, c, d, f)$

v) $\cap (P \cap N) = 2$

vi) $\cap (P \cup N) = 9$

vii) $\cap (P - N) = 3$

viii) $\cap (N - P) = 4$

Activity

Given that set Y = (1, 3, 5, 7, 9, 11, 13, 15, 17, 19) and Z = (2, 3, 5, 6, 7, 9, 10, 14)

a) Represent the above sets on the venn diagram

b) Find

i) $Y - Z$

ii) $Z - Y$

iii) $Y \cap Z$

iv) $Z \cup Y$

v) $\cap (Y \cap Z)$

vi) $\cap (Z \cup Y)$

Theme : Sets

Topic : Set concepts

Subtopic : Shading set regions

Competences

Language

The learner;

Reads, pronounces and writes words such as shading, regions

Subject

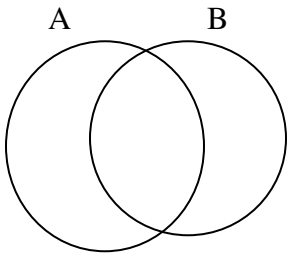
The learner;

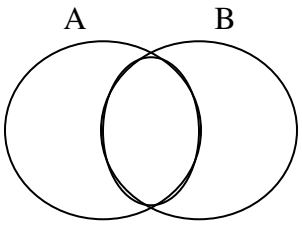
- Draws the venn diagrams
- Shades the required regions

Content

Shading set regions

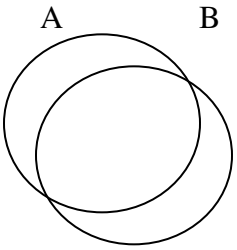
Set A





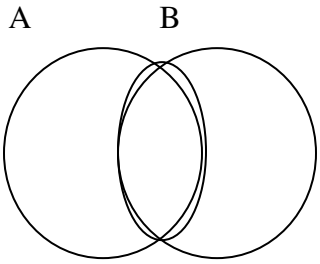
Set A∩B

Set B

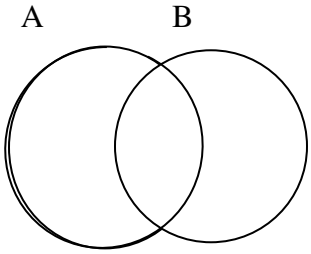


A – B

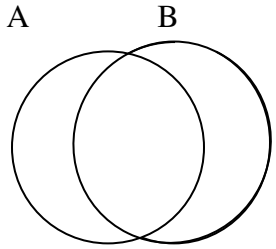
B¹ or A only

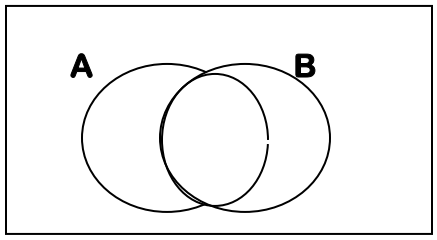


A∪B

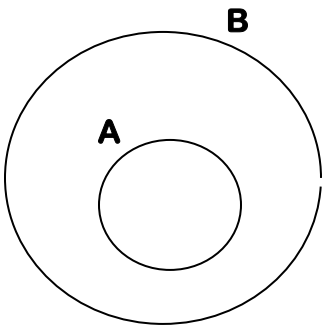


B – A or A¹ or B only

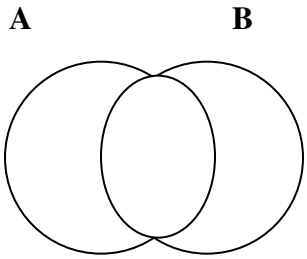




$(A \cup B)^1$



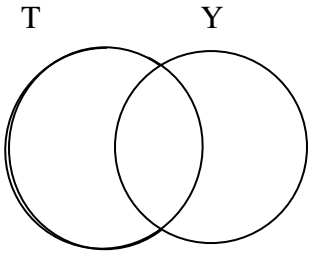
A $\underline{C}$B

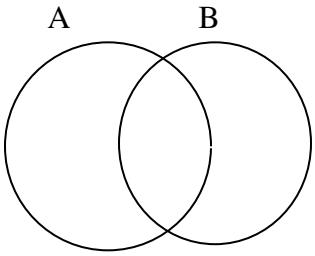


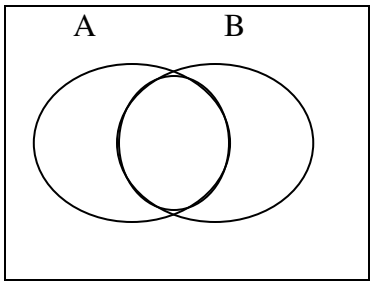
$(A \cap B)^1$

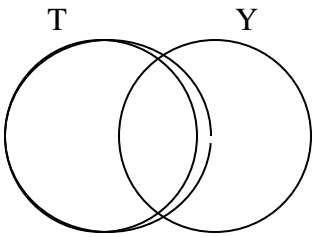
Activity

Describe the shaded set region below









Theme : Sets

Topic : Set concepts

Subtopic : Listening and finding number of subsets

Competences

Language

The learner;

Reads, pronounces and writes words such

-listing

Finding

Subsets

Subject

- States the symbol used when finding sub set
- Defines subsets
- State the formula for finding subsets

Content

Listing and finding number subsets

A subset is a small set that can be obtained from a big set. Symbol use in $\subset$

Formula 2^n

Example

Find the number of subsets of set A if A = (cat, dog)

Method 1

$\{\ \}, \{cat\}, \{dog\}, \{cat, dog\}$

There are 4 subsets

Method 2

Number of subsets $= 2^n$

$= 2^2$

$= 2 \times 2$

$= 4$ subsets

If set A = $\{1,2,3\}$

a) List the subsets

b) Find the number of subsets in set A.

$\{\ \}, \{1\}, \{2\}, \{3\}, \{1,2\}, \{1,3\}, \{2,3\}, \{1,2.3\}$

c) Number of subsets $= 2^n$

$= 2^3$

$= (2x2)\ x2$

$=$ 8 subsets

Activity

1. List the formular to work out the number of subsets.

a) T = $\{1,2\}$

b) Z = $\{3\}$

c) M = $\{\ \}$

d) D = $\{2,3,5\}$

2. Use the formular to work out the number of subsets

e) T = $\{1,2,3,4\}$

f) L = $\{1,2,5,7,8\}$

Theme : Sets

Topic : Set concepts

Subtopic : Application of sets

Competences

Language

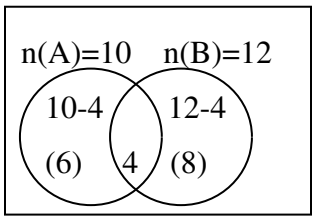
The learner;

Reads, pronounces and writes words such as application, sets.

Subject

The learner;

- Interprets the questions given
- Finds number of elements in sets
    - AUB
    - A – B
    - B – A



i) n(AUB) = 6+4+8

= 18

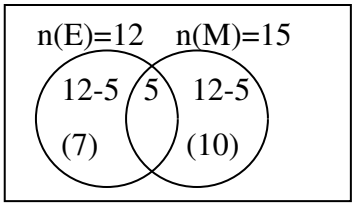
ii) A – B = 6

iii) B – A = 8

2. In a class, 12 pupils like English (E), 15 like Maths (M) and 5 pupils like both English and Maths.

a) Show this information on the venn diagram

b) How many pupils were in the class altogether?



The class had (7+5+10) pupils = 22 pupils

Activity

1. In class 18 pupils eat Posho (P) and 15 pupils eat Beans (B). If pupils eat both Posho and Beans.

a) Draw a venn diagram to show the given information.

b) How many pupils eat beans only?

c) How many pupils eat beans only?

d) How many pupils eat only one type of food?

2. It is given that 21 farmers grow beans (B) and 17 farmers grow ground nuts (G). If 9 farmers grow both beans and ground nuts.

a) Draw a venn diagram to show the given information

b) How many farmers grow beans only?

c) How many fathers grow groundnuts only?

d) How many farmers grow only one type of crop?

Theme : Sets

Topic : Set concepts

Subtopic : Finding probability when given number of items

Competences

Language

The learner;

Reads, pronounces and writes the words probability, chance etc.

Subject

The learner;

- interpret the given questions
- defines the term probability
- states the formation for probability

Content

Finding probability when given number of items

Probability is the same as chance.

Formular $= \frac{n(Events)}{n(Sample\ space)}$

Examples

1. There are 4 red pens and blue pens in a packet. A teacher picks one pen at random. What is the probability that the picked pen is a red one?

n (Events) = 4

n (Sample space) = 4 +8

= 12

Probability $= \frac{n(Events)}{n(Sample\ space)}$

$= \frac{4}{12}$

2. A bag contains 5 red pens and 15 blue pens. What is the chance of picking a red pen in a bag at random?

n(Events) = 5

n(Sample space = 5 + 15

= 20

Probability $= \frac{n(Events)}{n(Sample\ space)}$

$= \frac{5}{20}$

Activity

1. There are 5 blue pens and 4 black pens in a packet. A pupil picks one pen at random. What is the probability that the pen picked is a black pen?
2. In a basket, there are 4 ripe tomatoes and 6 row ones. What is the probability that mummy will pick a ripe one for cooking at random?
3. A basket contains 6 good eggs and 3 bad ones. If a boy picks an egg at random, what is the probability that the egg picked is a bad one?
4. In a primary five class, there are 25 girls and 15 boys. The school wishes to elect a head prefect from the primary five class. What is the probability that the head prefect elected is a girl?

Theme : Sets

Topic : Set concepts

Subtopic : Finding probability when a coin is tossed

Competences

Language

The learner;

Reads, pronounces and writes words such as probability and chance

Subject

The learner;

- Identifies the question given
- Lists the events and sample space.
- Finds the probability

Content

<u>Finding probability when a coin is tossed.</u>

<u>Examples</u>

1. If a coin is tossed once, what is the probability of a head appearing on top?

   Sample space $= \{head, tail\}$

   n(S) $= 2$

   Events $= \{head\}$

   n(E) $= 1$

Probability $= \frac{n(Events)}{n(S.S)}$

$= \frac{1}{2}$

Rolling a die

Example

1. If a die is rolling once, what is the probability of an even, number appearing on top?

Sample space $= \{1,2,3,4,5,6\}$

$n(S) = 6$

Events $= \{2,4,6\}$

$n(E) = 3$

Probability $= \frac{n(E)}{N(S.S)}$

$= \frac{3}{6}$

Activity

Roll a die and write the probability

1. What is the chance of getting a two?
2. There are six possible chances on a die.
    a. How many multiples of 3 are on a die?
    b. What is the probability of getting a multiple of 3?
3. a) How many chances does a die have altogether?
   b) How many multiples of 2 dos a die have?
   c) What is the probability of getting a face with less than 6 dots?
4. If a coin is tossed, what is the probability of a tail appearing on top?

Theme : Sets

Topic : Set concepts

Subtopic : Days of the week and months of the year

Competences

Language

The learner;

Reads, pronounces, spells and writes words such as year, months e.t.c.

Subject

The learner;

- Identifies the question given
- Finds the number of days and months of the year
- Finds the probability

Content

Finding probability of Days of the weak and months of the year

Examples

1. My mother will give birth to a baby next week. What is the probability that she will give birth on a day starting with letter "T"

   Sample space = $\{S, M, T, W, T, F, S\}$

   n(S.S) = 7

   Events = $\{T, T\}$

   n(E) = 2

   Probability = $\frac{n(E)}{n(S.S)}$

   $= \frac{2}{7}$

2. Amina is supposed to go to India , what is the probability that she will go on a day that starts with letter "J"

   Sample space = $\{J, F.M.A.M.J.J.A.S.O.N.D\}$

   n(S.S) = 12

   Events = $\{J, J, J\}$

   n(E) = 3

   Probability = $\frac{n(E)}{n(S.S)}$

   $= \frac{3}{12}$

Activity

1.a) What are the total chances in listing days of the week?

b) How many days begin with letter "T"?

c) What is the probability of travelling on a day that starts with letter "T"?

2. Two teams tossed a coin to decide what side they would choose to play. What is the probability that each team gets the side they wanted?

3. There are 10 cars of different colours. What is the probability of picking a white car at random?

Theme : Whole numbers

Topic : Forming numbers from digits

Subtopic :

Competences

Language

The learner;

Reads, pronounces, spells and writes words such as forming, digit

Subject

The learner;

- Finds all the numbers from given digits
- Identifies numbers basing on types of numbers.

Content

Forming numbers from digits

Example

1. Given the digit 3, 7, 5, use them to answer questions that follow.
   a) Form all possible 3 digit numbers
   b) Find the sum of the biggest and smallest numbers.
   c) Work out the difference between the highest and lowest.

3 5 7

3	5	7
357	537	753
375	573	735

357, 375, 537, 573, 753, 735

Smallest + highest

3 5 7

\+ 7 5 3

Difference = Highest – Lowest

= 7 5 3

\- 3 5 7

Activity

1. Give any four numbers that can be formed using the digits below
   a. 2, 5, 3, 7
   b. 9, 2, 6, 7, 8
   c. 5, 0, 4
2. Write down the smallest number that can be formed using all the digits below
   a. 1, 2, 7
   b. 3, 5, 2, 4
   c. 8, 4, 3, 6, 9

Theme : Whole numbers

Topic : Finding place values and values of whole numbers

Subtopic :

Competences

Language

The learner;

Reads, pronounces and writes words such as values, place values

Subjects

The learner;

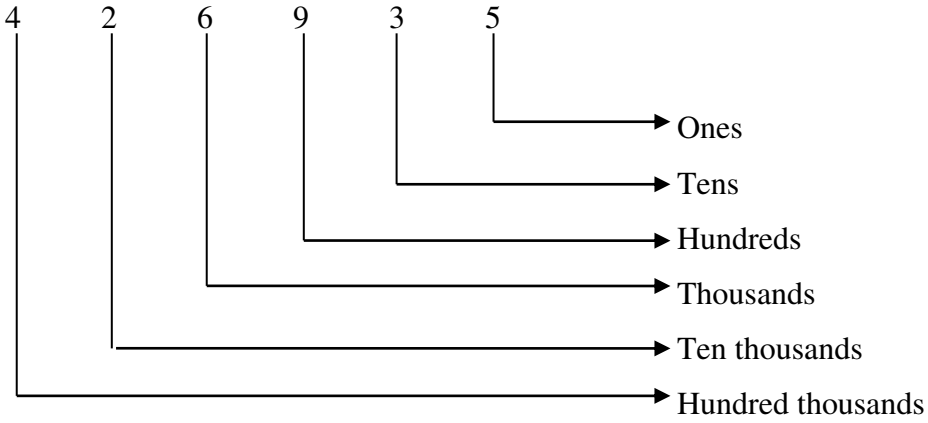
- Identifies the question given
- Finds place values
- Finds the values of underlined digits

Content

Finding place values and values of whole numbers

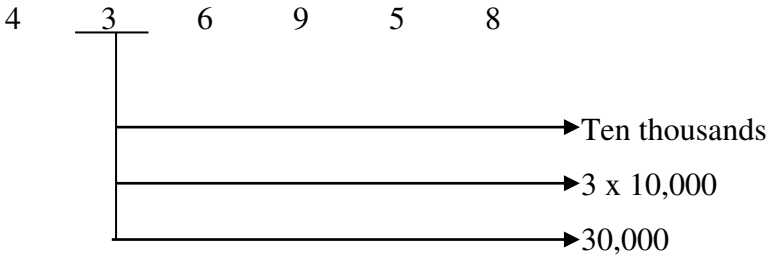
Examples

1. Find the place value of 2 in 4 2 6 9 3 5



Therefore : the place value of 2 is Hundred thousands

2. Find the value of 3 in 4 3 6 9 5 8



Therefore: The value of 3 is 30,000

Activity

1. Find the place value of each digit in 46937.
2. Write the value of each digit in 873,125

3. Find the place values of the underlined digits below.
    a. 4 4 5 8 0 5
    b. 6 4 9 3 7
    c. 7 6 9 3
4. Write the value of the underlined digit in the given numbers
    a. 1 2 5 0
    b. 4 1 3 7 8 3
    c. 3 4 0 1 7

Theme :

Topic : Whole numbers

Subtopic : Writing numbers in words

Competences

Language

The learner;

Reads, pronounces and spells words such as number words etc

Subject

The learner;

-Identifies the sections of every three digits

- Reads in words effectively

Content

Writing numbers in words

Examples

1. Write 1 5 6 0 3 6 in words

Millions	Thousands	Units
	156	036

One hundred fifty six thousand, thirty six.

2. Write 1 7 5 8, 9 0 3 in words

Millions	Thousands	Units
1	758	903

One million, seven hundred fifty eight thousand nine hundred three.

3. Write 66, 749,352 in words

Millions	Thousands	Units
66	749	352

Sixty six million, seven hundred forty nine thousand, three hundred fifty two.

Activity

Write the following numbers in words

1. 1 5 6 0
2. 300 7
3. 2850
4. 888,015
5. 999,999
6. 563,400
7. 482,029
8. 111,111
9. 136,407
10. 30,330

Topic : Whole numbers

Subtopic : Writing words into figures

Competences

Language

The learner;

Subjects

The learner;

- Identifies the number given
- Arranges the numbers according to their place value order

Content

Writing words into figures

Examples

1. Write "Four hundred twenty five thousand, three hundred seventeen" in figures.

   Four hundred twenty five thousand = 425,000

   Three hundred seventeen + 317

2. Write "Four hundred three thousand, five hundred two" in figures

   Four hundred three thousand = 403,000

   Five hundred two + 502

Activity

Write the following in figures

1. Six hundred two thousand, four hundred sixty six.
2. One hundred fifty seven thousand four.
3. Four hundred thirty nine thousand two hundred
4. Seven hundred twelve thousand, nine hundred one.
5. The bursar deposited eight hundred thousands, five hundred shillings on the school account. Write this amount in figures.
6. Write "Seven hundred twelve thousand, three hundred fifty one" in figures
7. A farmer sold his coffee and was paid four hundred fifty thousand, six shillings. Write this amount in figures.
8. Four hundred three thousand nine
9. Eight hundred twelve thousand sixty two
10. One hundred thousand, one.

Expanding whole number in place value / value and power form

Example

1. Expand 4 6 9 3 in place value

Th	H	T	O
4	6	9	3

(4 x Thousands) +(6 x Hundreds) + (9x Tens) + (3 x Ones)

(4 x 1000) + (6 x 100) + (9x10) + (3 x 1)

2. Expand 4 6 9 3 in value form

Th	H	T	O
4	6	9	3

(4 x 1000) + (6 x 100) + (9x10) + (3 x 1)

4000 + 600 + 90 + 3

3. Expand 4 6 9 3 in place value

Th	H	T	O
4	6	9	3

(4 x 1000) + (6 x 100) + (9x10) + (3 x 1)

(4 x 10 x 10x 10 x10) + (6x 10 x 10) + (9 x 10) + 3 x 1)

$(4x10^3) + (6 \times 10^2) + (9 \times 10^1) + (3 \times 10^0)$

Activity

A. Expand the following using place values

1. 89
2. 972
3. 1,873
4. 15,301
5. 19,972
6. 77,742
7. 992,789

B. Find the numbers in A above in value form

C. Expand the numbers in A above using powers of 10.

THEME : NUMERACY

Topic : NUMERATION SYSTEMS AND PLACE VALUES

Subtopic : Finding expanded numbers

Competences

Language

The learner;

Interprets the meaning of certain key words like, short form, single number etc.

Subject :

The learner;

- Completes the remaining steps from the given expansion to get correct values for each
- Arranges numbers vertically when adding

Content

Finding expanded numbers

Examples

1. Write (4x1000) + (5 x 100) + (8 x 1) as a single number.

   (4x10,000) + (x 100) + (8 x 1)

   40,000 + 500 + 8

   40,000

   500

   \+ 8

   40,508

2. Write 400,000 + 60,000 + 40 + 1 as a single number

   400, 000

   + 60,000

   40

   460,041

   Activity

   What number has been expanded to give:

   1. (3 x thousands) + (4 x hundreds) + (7 x 10)
   2. (4 x 10000) + (5 x1000) + (6 x 1)
   3. (5×10^5)
   4. $(4 \times 10^4) + (5x\ 10^3) + (3x10^2) + (2 \times 10^1) + (8 \times 10^0)$
   5. 400,000 + 80,000 + 90 + 8

Topic : Whole numbers

Subtopic : Finding sum, difference and product

Competences

Language

The learner;

Reads, pronounces and write and spells words like sum, difference and product.

Subject:

The learner;

- Interprets the question given
- States the meaning of difference, sum and product

Content

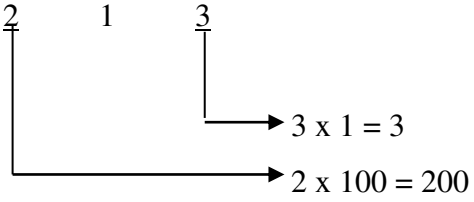
Finding sum, difference and product of whole number

Example

Find the sum, difference and product of the value of 2 and 3 in 6213

Sum

6 2 1 3



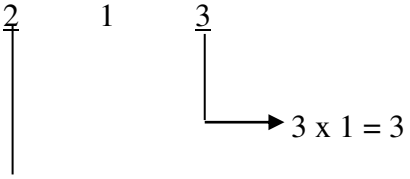
2 0 0

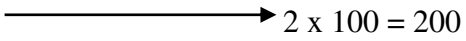
\+ 3

2 0 3

Difference

6 2 1 3





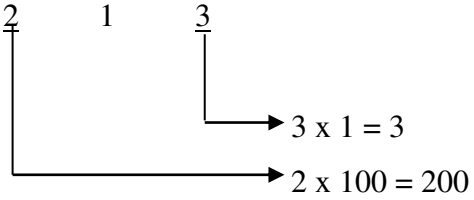
2 0 0

\- 3

1 9 7

Product

6 2 1 3



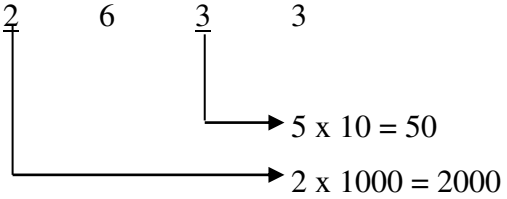
2 0 0

x 3

6 0 0

2. Find the product of the value of 2 and 5 in 4 2 6 5 3

4 2 6 3 3



2 0 0 0

x 5 0

0 0 0 0

1 0 0 0 0

1 0 0 0 0 0

Activity

Find the sum difference and product of the underlined digits below

1. 6 4 9 3
2. 9 6 3 5 4

3. 4 6 1 4

4. 2 6 3

5. 8 6 4 1 4 3

LESSON 9

Topic : Whole numbers

Subtopic : Roman numerals

Competences

Subject

The learner;

Read, write, pronounce and interpret the meaning of key words like Roman, numerals, Hindu Arabic etc.

- Identifies the major or basic Roman numerals, the major 3 classifications of roman numerals
- Identifies numbers whose Roman numerals are got by repeating

Content

The table below shows the basic Roman numerals and their Hindu Arabic numerals, complete it correctly,

Hindu-Arabic numerals	_____	_____	_____	**50**	**100**	**500**	**1000**
Roman numerals	I	V	**X**	**L**	**C**	**D**	**M**

The formation of other Roman numerals is classified into 3 categories

- ✓ **Roman numerals formed by repeating**
- ✓ **Roman numerals formed by adding**
- ✓ **Roman numerals formed by subtracting**

By repeating

These are based on three digits ie, 1, 2, 3 as shown in the table below, complete it correctly

Hindu Arabic numerals	**1**	**2**	**3**	**10**	**20**	**30**	**100**	___	___	**1000**	___	___
Roman numerals	**I**	**II**	**III**	**X**	___	___	**C**	___	___	**M**	___	___

TRIAL NUMBERS

Write the following Hindu Arabic numerals in Roman numerals

a. **13**
b. **25**
c. **321**
d. **532**

Write the following Roman numerals in Hindu Arabic numerals

a. **XII**
b. **XXXV**
c. **CLII**
d. **MDXXII**
e. **MMCIII**

ACTIVITY

1. **EXPRESS THE FOLLOWING AS ROMAN NUMERALS**

a. **15**
b. **23**
c. **52**
d. **152**
e. **335**
f. **1353**

2. **CONVERT THE FOLLOWING TO HINDU-ARABIC NUMERALS**

a. **XII**
b. **XXIII**
c. **LV**
d. **CCLVII**
e. **DLI**
f. **MMDXXXII**

Examples

1. Change 25 to Roman numerals.

   20 + 5

   XX + V

   25 = XXV

2. Convert XIX to Hindu Arabic numerals .

   X/IX

   X + IX

   10 + 9

   = 19

3. Aidah was born in 1972m how old is she now in Roman numerals.

   2 6 1 5

   - 1 9 7 2

   43 years

   Aidah is 40 + 3

   XL + III

   XLIII years.

Activity

A: Express the following as Roman numerals

1. 19
2. 45
3. 89
4. 35
5. 44

B: Express the following as Hindu –Arabic numerals

6. LXXIII
7. XLVII

8. LXXX
9. Mugwanya has XXIX chicken. Write this number in Hindu-Arabic numerals.
10. Opio harvested XV bags of rice last season. Express his harvest in Hindu – Arabic numerals

Topic : Whole numbers

Subtopic : Rounding off to the nearest place value required

Competences

Language

The learner;

Reads, pronounces and writes words such as rounding, nearest

Subject

The learner;

- Defines the term rounding off
- Identifies the queston given
- States when to round up or down

Rounding off to the nearest place value required.

Examples

1. Round off 585 to the nearst tens

H	T	O
5	8	5
+	1	
5	9	0

Therefore : 5 8 3 ⟶ 590

2. Round off 530 to the nearest hundreds

	TH	H	T	O
	7	6	9	4
+	1			
	8	0	0	0

Therefore : 7 6 9 4 ⟶ 8000

3. Round off 530 to the nearest hundreds.

H	T	O
5	3	0

+ 0

5 0 0

Therefore : 5 8 3 590

Activity

A: Round off the following to the nearest tens

1. 24
2. 134
3. 452
4. 578
5. 946

B: Round off the following to the nearest hundreds

6. 136
7. 249
8. 363
9. 421
10. 576

C: Round off the following to the nearest thousands

11. 1240
12. 1381
13. 3407
14. 3941
15. 5631

Topic : Whole numbers

Subtopic : Addition of whole numbers up to 6 digits

Competences

Subject

The learner;

- Identifies the question given
- Arranges the number vertically
- Regroups where necessary
- Interprets the application about addition
- States words which are related to addition

Content

Addition of whole numbers up to 6 digits

Example

1. Add: 4 73, 442 + 369, 215

	4	7	3	4	4	2
+	3	6	9	6	5	7
	8	4	2	6	5	7

2. A steel rolling factory made 384m 729 iron sheet in May and 297, 345 iron sheets in June. How many sheets were made in the two months?

   May = 3 8 4 7 2 9 iron sheets

   June = + 2 9 7 3 4 5 iron sheets

   6 8 2 0 7 4 iron sheets

   There 682074 iron sheets were made

Activity

Add:

1. 1 1 2 2 3 0 + 1 1 2 2 3 0 _____

2. 1 2 3 6 7 4 +1 1 2 2 3 0 _____

3. 4 3 6 2 4 5 + 1 3 2 2 4 8 _____

4. 7 7 4 1 3 2 +1 6 3 1 4 2 _____

5. Dairy corperation processes 456,995 litres of milk, Jesa farm processes 213,143 litres of milk. How much milk do they produce altogether?

6. Kamya went to the market and bought 10 goats at sh. 135,000 and 12 sheep at sh. 107,900. How much did he spend altogether?

Topic : Operations on numbers

Subtopic : Subtraction of whole numbers upto 6 digits

Competences

Subject

The learner;

- Identifies the question given
- Arranges numbers vertically according to their respective place value.
- Re-groups where necessary

Content

Subtraction of whole numbers up to 6 digits

Example

1. Subtract : 1 2 3 6 4 3 – 3 6 7 4 9

$$\begin{array}{r} 1\ 2\ 3\ 6\ 4\ 3 \\ -\quad 3\ 6\ 7\ 4\ 9 \\ \hline 8\ 6\ 8\ 9\ 4 \end{array}$$

2. By how much is 367,015 greater than 346729

$$\begin{array}{r} 3\ 6\ 7\ 0\ 1\ 5 \\ -\quad 3\ 4\ 6\ 7\ 2\ 9 \\ \hline 2\ 0\ 2\ 8\ 6 \end{array}$$

3. A filling station sold 404560 litres of petrol out of the 987403 litres in the tank. How much fuel was left?

$$\begin{array}{r} 9\ 8\ 7\ 4\ 0\ 3 \\ -\quad 4\ 0\ 4\ 5\ 6\ 0 \\ \hline 5\ 8\ 2\ 8\ 4\ 3 \end{array}$$

4. Subtract the following

$$\begin{array}{r} 1\ 2\ 3\ 6\ 4\ 5 \\ -\quad 1\ 2\ 3\ 4\ 8 \\ \hline \end{array}$$

$$\begin{array}{r} 2\ 3\ 4\ 8\ 6\ 3 \\ -\quad 5\ 2\ 6\ 8\ 4 \\ \hline \end{array}$$

$$\begin{array}{r} 2\ 7\ 4\ 8\ 6\ 3 \\ -\quad 5\ 2\ 6\ 8\ 4 \end{array}$$

```
  9 4 5 4 5 6
- 1 8 3 4 8
```

5. A water tank holds 100,000 litres of water. If 36,190 litres are used, how much water is left in the tank?
6. What must be added to 403,126 to get 520,200?
7. Farmers planted 298,770 seedlings of coffee, 112,429 trees did not grow. How many trees grew up?
8. Out of the 498,500 people in a town 239,718 are employed. Find the number of people that are unemployed.

Topic : Operations on numbers

Subtopic : Multiplication by the digit numbers

Competences

Subject

The learner;

- Arranges the number vertically before multiplying
- Multiplies the following place value in order.

Multiplication of whole numbers by 2 digits

Examples

1. Multiply 35 by 2

```
  3  5
x    2
-------
  7  5
```

S/W

2 x 5 = 10

2 x 3 = 6 + 1

= 7

2. Find the product of 35 and 12

```
  3  5
x 1  2
-------
  7  0
+ 3  5
```

S/W

2 x 5 = 10

2 x 3 = 6 + 1 =7

1 x 5 = 5

4 2 0

1 x 3 = 3

3. Work out: 2 4 9 x 32

```
  2 4  9
x   3  2
  4 9  8
+7 4  7
7 9 6 8
```

S/W

2 x 9 = 18

2 x 4 = 8 + 1 =9

2 x 2 = 4

3 x 9 = 27

3 x 4 = 12 x 2 = 14

3 x 2 = 6 + 1 = 7

Activity

Multiply:-

2 8	3 4	5 6	4 5
x 1 1	x 1 2	x 2 3	x 2 5
_____	_____	_____	_____
2 2	3 6	4 6 3	
x 1 5	x 2 2	x 4 5	
_____	_____	_____	

Topic : Operations on numbers

Subtopic : More about multiplication

Competences

Subject

The learner;

- Interprets the question given
- Arranges the number vertically
- Indicates the unites where necessary

Content

More about multiplication of whole number

Examples

1. A rectangular floor is covered by 26 tiles along its length and 15 a long its width. How many tiles are there altogether?

   26 x 1 5

   Total number of tiles = 2 6

   x 1 5

   1 3 0

   + 2 6

   3 9 0

   5 x 6 = 30

   5 x 2 = 10 + 3 = 13

   1 x 6 = 6

   1 x 2 = 2

   Therefore ; there are 390 tiles altogether.

2. A factory produces 50 bags of nails a day. If e ach bag contains 800 nails. How many nails do they produce daily?

   1 bag - 800 nails

   50 bags - 8 0 0

   x 5 0

   0 0 0

   + 4 0 0 0

   40,0 0 0 nails

   0 x 0 = 0

   0 x 0 = 0

   0 x 8 = 0

   5 x 0 = 0

   5 x 0 = 0

   5 x 8 = 40

   Therefore; They produce 40,000 nails daily.

3. A rectangular garden measures 322 metres by 56 metres. What is the area of the garden in square metres?

   Length = 322 metres

   Width = 56 metres

   Area = ?

   Area = L x w

   = 322m x 56 m

3 2 2	6 x 2 = 12
x 5 6	6 x 2 = 12 + 2 = 13
1 9 3 2	6 x 3 = 18 + 1 = 19
+ 1 6 1 0	5 x 2 = 10
18 0 3 2	5 x 2 = 10 + 1 = 11
	5 x 3 = 15 +1 = 16

Area = 18032m^2

Activity

1. A rectangular play ground measures 120 metres by 48 metres. How many square metres make up the play ground?
2. A parade of soldiers was made up of 233 row. There are 50 soldiers in each row. How many soldiers were there?
3. A printer produced 495 boxes of books. Each box had 24 books. How many books were there altogether?
4. Kampala chalk factory produces 90 cartons of chalk in a day. Each carton contains 36 boxes of chalk. How many boxes of chalk does the factory produce in a day?
5. A lorry can carry 600 crates of soda. Each crate contains 24 bottles of soda. How many bottles does it carry?

Topic : Operations on numbers

Subtopic : Division of whole numbers

Competences

Subject

The learner;

- Identifies the question given
- Finds the multiples of the divisor
- Defines words such as quotient, dividend and division

Content

Division of whole numbers

Examples

1. Divide 5 4 2 4 by 2

2 7 1 2 | 2 x 0 = 0

```
  2  5  4  2  4
2 x 2 = - 4
        1  4
7x2 =   -1  4
           2
1x2 =      - 2
              4
2x2=          - 4
```

Therefore; 5424 ÷ 2 = 2712

2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
2 x 7 = 14

2. Divide 3000 by 125

```
          0 0 2 4
      ┌──────────
125   │ 3 0 0 0
0 x 125 = - 0
          3 0
0x125 =   -0 0
          3 0 0
        - 2 5 0
2x125 =   2 5 0
            5 0
4x125=      5 0 0
```

Therefore;3000 ÷ 125 = 24

125 x 0 = 0
125 x 1 = 125
125 x 2 = 250
125 x 3 = 375
125x 4 = 500
125x 5 = 625

3. 1260 pupils sat for examination. If each class presented 60 pupils, how many classes were there?

```
          1260 ÷ 60
          0 0  2 1
      ┌──────────
 60   │ 1  2 6 0
0 x 60 = - 0
         1  2
0x60 =   - 0  0
         1  2 6
2x60  =  - 1  2 0
              6 0
1x60 =        - 6 0
```

125 x 0 = 0
125 x 1 = 125
125 x 2 = 250
125 x 3 = 375
125x 4 = 500
125x 5 = 625

0 0

Therefore; There were 21 classes

Activity

A: Divide

1. 840 ÷ 10
2. 1380 ÷ 60
3. 1920 ÷ 80
4. 1440 ÷ 40
5. 1240 ÷ 40

B:

6. A house is to be roofed using 4599 tiles. If a box required to complete the work?
7. Divide 14620 by 340
8. A school of 602 pupils needs to be split up into 14 classes. How many pupils will each class have?

Topic : Operations on numbers

Subtopic : Mixed operations

Competences

Subject

The learner;

- Follows the order of BODMAS
- Works out numbers basing on BODMAS

Content

Mixed operations

BODMAS in full

B ⟶ Bracket
O ⟶ Of
D ⟶ Division
M ⟶ Multiplication
A ⟶ Addition
S ⟶ Subtraction

Examples

1. Workout : $42 \div (7 \times 6) \times 2$ B O D M A S

7×6

42

$42 \div 42$

$= 1$

1×2

$\underline{= 2}$

2. Work out: $5 + (3 \times 10)$ B O D M A S

3×10

30

$5 + 30$

$\underline{35}$

3. $(8 - 5) - (3 \times 2) + (2 \times 2)$ B O D M A S

$3 - 6 + 4$

$3 + 4 - 6$

$7 - 6$

1

4. $2 - 8 + 9$

$2 + 9 - 8$

$11 - 8$

3

Activity

Work out

1. $28 - (4 \times 5)$
2. $8 + 4 \times 5$
3. $9 \times (9 + 3)$
4. $(9 \times 9) + 3$

5. 6 – 10 + 7
6. 32 – 40 + 18
7. 18 – (4 x 3) ÷ 6
8. 33 x 2 + 12 ÷ 12

Topic : Operations on numbers

Subtopic : Counting in twos and fivs

Competences

Subject

The learner;

- Counts numbers in groups of 2 or 5.
- Writes numbers in base two or five.

Content

Counting in twos and fives

Examples

1. Count 6 in base five



1 group of fives, 1 ones

$11_{\textbf{five}}$

2. Count 3 in base five



1 group of two, 1 ones

$11_{\textbf{two}}$

3. Count 26 in base five



1 group of five fives, 0 group of fives, 1 ones

$101_{\textbf{five}}$

4. Count 22 in base five.

//// //// //// ////

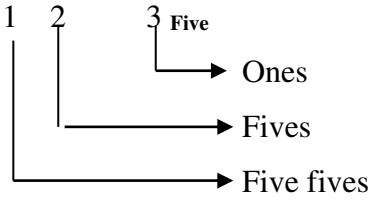
$40_{\textbf{five}}$

Finding place values and values

Examples

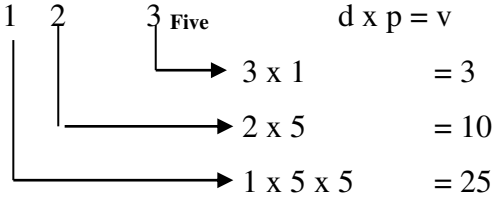
1. Find the place value of each digit

   $123_{\textbf{five}}$



2. Work out the value of each digit in $123_{\textbf{five}}$

   $123_{\textbf{five}}$



Therefore;

The value of 3 is 3

The value of 2 is 10

The value of 1 is 25

Activity

1. Count the following in fives.
   a) 10
   b) 15
   c) 18

d) 30

2. Find the place value of each digit in the following
    a. 122_{five}
    b. 103_{five}
    c. 331_{five}
    d. 212_{five}
3. Find the value of each digit
    a. 112_{five}
    b. 333_{five}
    c. 211_{five}

Topic : Operations on numbers

Subtopic : Changing base five to base ten

Competences

Subject

The learner;

- Identifies the question given
- Finds the value of each digit.
- Adds up the digits to get base 10.
- Identifies other words to mean base ten.

Content

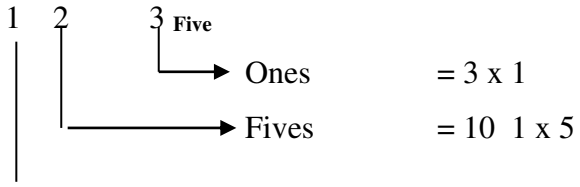
<u>Changing base five to base ten</u>

Other names for base ten are

- Denary base
- Decimal base

1. Change 213_{five} to base ten.

123_{five}



→ Five fives = 2 x 5 x 5

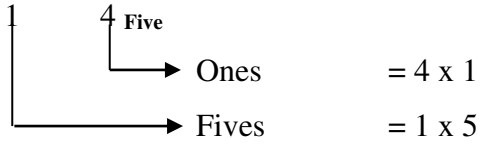
(2 x 5 x 5) + (1 x 5) + (3 x 1)

50 + 5 + 3

5 0
+ 5
3
5 8 ten

2. Change $14_{\textbf{five}}$ to base ten.

$123_{\textbf{five}}$

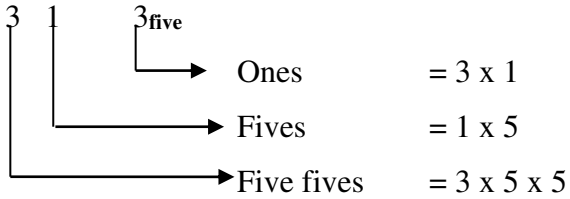


(1 x 5) + (4 x1)

5 + 4

9 ten

3. Convert $313_{\textbf{five}}$ to decimal base



(3 x 5 x 5) + (1 x5) + (3 x1)

75 + 5 + 3

7 5
+ 5
3
8 3 ten

Activity

Change the following to b ase ten.

1. 13_{five} 2. 21_{five} 3. 23_{five} 4. 32_{five}

5. 22_{five} 6. 34_{five} 7. 112_{five} 8. 310_{five}

Topic : Operations on numbers

Subtopic : Changing base ten to base five

Competences

Subject

The learner;

- Identifies the question given
- Divides the numbers by the required base (base five)

Content

Changing base ten to base five

Examples

1. Change 58_{ten} to base five

B	N	R
5	58	3
5	11	1
5	2	2
	0	

Therefore $58_{\text{ten}} = 213_{\text{five}}$

2. Convert 9ten to base five

B	N	R
5	9	4
5	1	1
	0	

Therefore $9_{\text{ten}} = 14_{\text{five}}$

3. 74_{ten}

B	N	R
5	74	4

5	14	4
5	2	2
	0	

Therefore $74_{ten} = 244_{five}$

Activity

Change the following to base five

1. 8_{ten} 2. 11_{ten} 3. 15_{ten} 4. 21_{ten}

5. 33_{ten} 6. 42_{ten} 7. 41_{ten} 8. 55_{ten}

Topic : Operations on numbers

Subtopic : Addition in bases

Competences

Subject

The learner;

- Identifies the question given
- Arranges the numbers vertically according to their place value order
- Groups in fives and writes the remainders

Content

Addition in bases

1. Add: $1\,2_{five} + 11_{five}$

$1\,2_{five}$

$+\,1\;\;1_{five}$

$2\;\;3_{five}$

$1 + 2 = 3$

$1 + 1 = 2$

2. Work out: $133_{five} + 241_{five}$

$1\;\;3\;\;3_{five}$

$+\,2\;\;4\;\;1_{five}$

$4\;\;3\;\;4_{five}$

$3 + 1 = 4$

$3 + 4 = 7$

(////) //

$= 1$ r 2

$1 + 2 + 1 = 4$

3. Add: $330_{five} + 242_{five}$

$0 + 2 = 2$

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$$\begin{array}{r} 3\ \ 3\ \ 0_{\text{five}} \\ +\ 2\ \ 4\ \ 2_{\text{five}} \\ \hline 1\ 1\ \ 2\ \ 2_{\text{five}} \end{array}$$

$3 + 4 = 7$

$7 \div 5 = 1$ r $\textcircled{2}$

$3 + 2 = 5 + 1$

$= 6 \div 5$

$= 1$ r 1

Activity

Add the following in base five.

1. $2_{\text{five}} + 2_{\text{five}}$
2. $211_{\text{five}} + 44_{\text{five}}$
3. $13_{\text{five}} + 44_{\text{five}}$
4. $44_{\text{five}} + 32_{\text{five}}$
5. $234_{\text{five}} + 231_{\text{five}}$
6. $4_{\text{five}} + 4_{\text{five}}$
7. $121_{\text{five}} + 212_{\text{five}}$
8. $34_{\text{five}} + 43_{\text{five}}$

Topic : Operations on numbers

Subtopic : Subtraction in bases

Competences

Subject

The learner;

- Identifies the question given
- Arranges the numbers vertically before subtracting
- Re-groups in times

Content

Subtracting in bases

Examples

1. Subtract: $102_{\text{five}} - 22_{\text{five}}$

$$\begin{array}{rrr} 1 & 0 & 2_{\text{five}} \\ - & 2 & 2_{\text{five}} \end{array}$$

3 0_{five}

2. Subtract : $200_{\text{five}} - 11_{\text{five}}$

2	1	0_{five}
-	1	1_{five}
1	3	4_{five}

3. Workout: 210 – 121

	2	1	0
-	1	2	1
		3	4

Activity

Subtract

1. $210_{\text{five}} - 22_{\text{five}}$
2. $40_{\text{five}} - 2_{\text{five}}$
3. $221_{\text{five}} - 12_{\text{five}}$
4. $101_{\text{five}} - 22_{\text{five}}$
5. $100_{\text{five}} - 22_{\text{five}}$

Topic : Operations on numbers

Subtopic : Expressing and addition in finite five and seven

Competences

Subject

The learner;

- Identifies the question given
- Groups in fives and sevens
- Adds effectively

Content

Expressing and adding in finite five and seven

Examples

1. Write 25 to finite 7.



3 groups of sevens remainder 4

Therefore ; 25 = 4 (finite 7)

2. Add: 4 + 3 = ___ (finite 5)

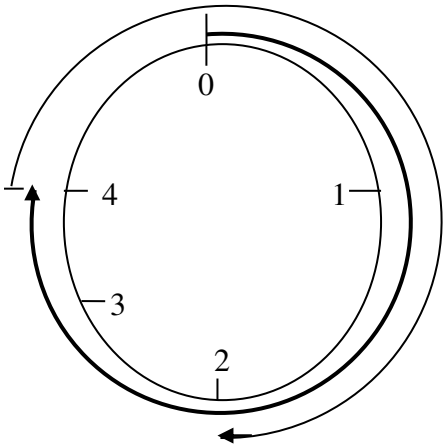
Method 1

4 + 3 = ___ (finite 5)

7 ÷ 5 = 1 rem 2

4 + 3 = 2 (finite 5)

Method 2



Therefore; 4 + 4 = 2 (finite 5)

Activity

1. 2 + 3 + 2 = ___ (finite 5)

2. 4 + 2 + 3 = ___ (finite 7)
3. 6 + 3 + 5 = ___ (finite 7)
4. 3 + 3 + 4 = ___ (finite 5)
5. 3 + 1 + 3 = ___ (finite 7)
6. 2 + 2 + 3 = ___ (finite 5)

Topic : Operations on numbers

Subtopic : Subtracting in finite 5 and 7

Competences

Subject

The learner;

- Identifies the question given
- Subtracts the number effectively

Content

Subtracting in finite 5 and 7

Examples

1. Workout : 2 – 4 = ____(finite 5)

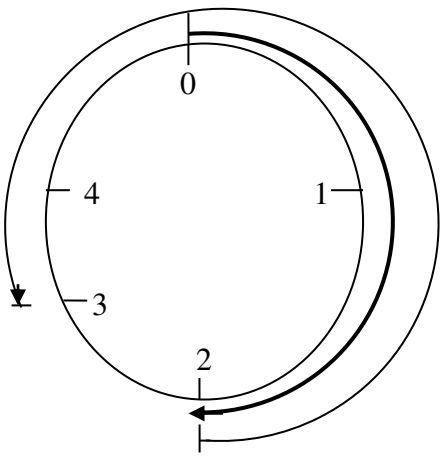
   Method 1

   2 + 5 – 4 = ___ (finite 5)

   7 – 4 = ___ (finite 5)

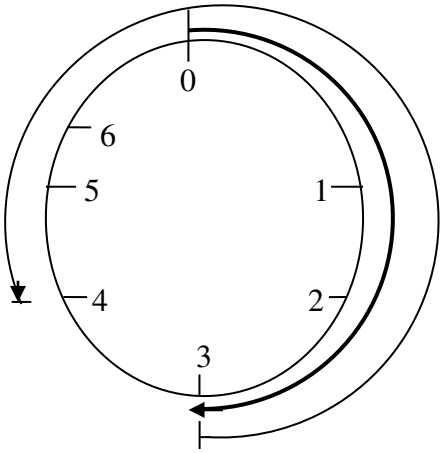
   Therefore 2 – 4 = 3 (finite 5)

   Method 2



2 – 4 =3 (finite 5)

2. Subtract 3 – 5 = ___ (finite 7) using a dail.



3– 5 =5 (finite 7)

3. Subtract 4 – 6 = ___ (finite 7)

4 + 7 – 6 = ___ (finite 7)

11 – 6 = 5 (finite 7)

4 – 6 = 5 (finite 7)

Activity

Workout the following without using a dail.

1. 2 – 3 = _____(finite 5)
2. 3 – 4 = _____(finite 5)
3. 3 – 6 = _____(finite 7)
4. 5 – 8 = _____(finite 7)
5. 1 – 3 = _____(finite 5)

Use a dial to work out the following

6. 2 – 4 = _____(finite 5)
7. 3 – 5 = _____(finite 7)
8. 5 – 6 = _____(finite 7)

Topic : Number patterns and sequences

Subtopic : Divisibility test for 2, 3 and 5

Competences

Subject

The learner;

- Defines the word divisibility
- Finds when to divide a number by 2, 3, 5

Language

The learner;

Reads, pronounces, spells and writes words such as Divisibility, tests.

Content

<u>Divisibility tests for 2,3,5</u>

- A number is divisible by 2 when the last digit is either 0, 2,4,6,8
- A number is divisible by 3 when the digits of a number are summed up and get a multiple of 3 such as 3, 6, or 9.
- A number is divisible by 5 when its last digit is either 0 and 5.

Activity

A: circle the numbers that are divisible by 2

1. 20, 55, 66, 73, 84, 41
2. 63, 74, 55, 65, 63, 80

B: Circle the number that are divisible by 3.

3. 147, 99, 67. 14, 190, 20
4. 20, 40, 56, 72, 42, 10

C: Circle the numbers that are divisible by 5.

5. 61, 60, 25, 43, 75, 17, 12, 20, 13
6. 120, 123, 142, 165, 183

Topic : Number patterns and sequences

Subtopic : Finding prime numbers

Competences

Subject

The learner;

- Identifies the question given
- Uses prime factors to break down big numbers

Content

Finding prime numbers

Prime numbers are numbers that have got two factors one and itself.

Examples

1. Write elements in a set of prime numbers between 10 and 40

~~10~~ 11 ~~12~~ 13 ~~14~~ ~~15~~ ~~16~~ 17 ~~18~~ 19 ~~20~~

~~21~~ ~~22~~ 23 ~~24~~ ~~25~~ ~~26~~ ~~27~~ ~~28~~ ~~29~~ ~~30~~ 31

~~32~~ ~~33~~ ~~34~~ ~~35~~ ~~36~~ 37 ~~38~~ ~~29~~

11, 13, 17, 19, 23, 29, 31, 37

2. Given that set T = (prime numbers less than 20)

List elements is set T

~~0~~ ~~1~~ ~~2~~ 3 ~~4~~ 5 ~~6~~ ~~7~~ ~~8~~ ~~9~~ ~~10~~

11 ~~12~~ 13 ~~14~~ ~~15~~ ~~16~~ 17 ~~18~~ 19 ~~20~~

T = (2, 3, 5, 7, 11, 13, 17, 19)

If set Y = (Prime numbers between 90 and 100.

a) List elements in set Y

b) Find n(Y)

Y = ~~90~~, ~~91~~, ~~92~~, ~~94~~, ~~95~~, ~~96~~, 97, ~~98~~, ~~99~~, ~~100~~

Y = (97)

n(Y) = 1

Activity

1. Given that Y = (prime numbers between 30 and 40). List them.
2. How many prime numbers are there between 20 and 30?

3. Given that set N = (prime numbers less than 20)
    a. List them
    b. Find the n(N)

4. Set T is a set of prime numbers between 10 and 20. List them.

Topic : Number patterns and sequences

Subtopic : Prime factorization

Competences

Subject

The learner;

- Defines the term factorization
- Uses prime factors to break down big numbers

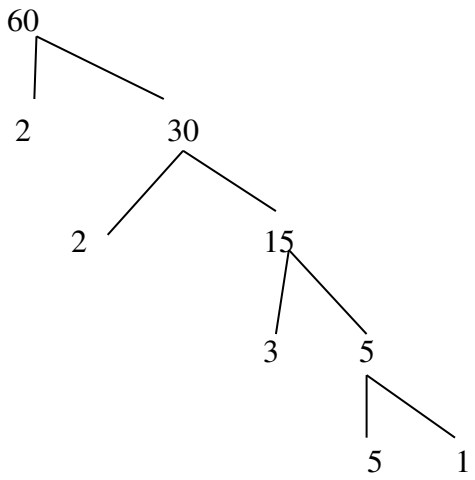
Content

Prime factorization

Examples

1. Find the prime factors of 60 and represent your answers in
    a. Subscript / set notation
    b. Multiplication form
    c. Power form

2	60
2	30
3	15
5	5
	1

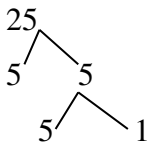


$F_{60} = (2_1, 2_2, 3_1, 5_1)$

$F_{60} = (2 \times 2 \times 3 \times 5)$

$F_{60} (2^2 \times 3^1 \times 5^1)$

2. Prime factorize 25



$F_{25} = (5_1, 5_2)$

$F_{25} = (5 \times 5)$

$F_{25}(5^2)$

Activity

Prime factorize the numbers and answer as instructed in the brackets

1. 4 (in set notation)
2. 6 (in multiplication form)
3. 9 (in subscript form)
4. 15 (in multiplication form)
5. 27 (in multiplication form)
6. 40 (in set notation)
7. 72 (in subscript form)

Topic : Number patterns and sequences

Subtopic : Finding factors of numbers

Competences

Subject

The learner;

- Identifices the question given
- Divides in order to get factors of a number

Content

<u>Finding factors of numbers</u>

A factor is a number that divides another an exact number of times.

<u>Examples</u>

1. How many factors has 12?

$\frac{12}{1} = 12$

$\frac{12}{2} = 6$

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

1 x 12 = 12

2 x 6 = 12

2 x 4 = 12

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

There are 6 factors.

2. Find all the factors 144

$\frac{144}{2} = 72$

$\frac{144}{3} = 48$

$\frac{144}{4} = 36$

$\frac{144}{6} = 24$

$\frac{144}{8} = 18$

$\frac{144}{12} = 12$

1 x 144 = 144

2 x 72 = 144

3 x 48 = 144

4 x 36 = 144

6 x 24 = 144

8 x 18 = 144

12 x 12 = 144

F_{144} = (1,2,3,4,6,8,12,18,24,36,48,72,144)

There are 6 factors.

Activity

A: Find the factors of the following

1. 4
2. 9
3. 16
4. 36
5. 64

B: Find the factors of the following

6. 13
7. 19
8. 67
9. 3
10. 7

Topic : Number patterns and sequences

Subtopic :

Competences

Subject

The learner;

- states GCF and LCF in full
- Lists the factors of given numbers
- Finds the GCF and LCF

Language

The learner;

Reads, pronounces, writes words such as factors, least e.t.c.

Content

<u>Finding GCF / LCF</u>

GCF is Greatest Common Factor

LCF is Least / Lowest Common Factor

<u>Examples</u>

1. a) List all the factors of 12 and 15

   b)Find the common factors

   c) Find the GCF of 12 and 15

   d) What is the LCF of 12 and 15

$\frac{12}{1} = 12$

$\frac{12}{2} = 6$

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

1 x 12 = 12

2 x 6 = 12

3 x 4 = 12

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

<u>There are 6 factors</u>.

$\frac{15}{1} = 125$

1 x 15 = 15

$\frac{15}{3} = 5$ $\quad$ 3 x 5 = 15

$F_{15} = (1, 3, 5, 15)$

b) $F_{12} = (\textcircled{1}, 2, \textcircled{3}, 4, 6, 12)$ $\quad$ $F_{15} = (\textcircled{1}, \textcircled{3}, 5, 15)$

C.F = (1, 3)

c) GCF = 3

d) LCF = 1

2. a) Find the factors of 48 and 60

b) Find the common factors

c) Workout the HCF of 48 and 60

d) What is the LCF of 48 and 60

$\frac{48}{1} = 48$

$\frac{48}{2} = 24$

$\frac{48}{4} = 12$

$\frac{48}{6} = 8$

1 x 48 = 48

2 x 24 = 48

3 x 16= 48

4 x 12 = 48

6 x 8 = 48

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

$\frac{60}{1} = 60$

$\frac{60}{2} = 30$

$\frac{60}{3} = 60$

$F_{60} = (1, 2,3,4,5,6,10,12,15, 20,30,60)$

3 x 5 = 15

$\frac{60}{4} = 15$

$\frac{60}{5} = 12$

$\frac{60}{6} = 10$

b) F_{48} = (1, 2, 3, 4, 6, 8, 12, 16, 24, 48) F_{60} = (1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60)

C.F = (1, 2, 3, 4, 6, 12)

c) GCF = 12

d) LCF = 1

Activity

Find the factors, Common factors , GCF and LCF of the following

1. 6 and 9
2. 12 and 18
3. 12 and 24
4. 18 and 28
5. 30 and 45
6. 72 and 60

Topic : Number patterns and sequences

Subtopic : Finding GCF / HCF by prime factorizing

Competences

Subject

The learner;

- Interprets the questions given
- Uses prime factors to break down the number

Content

Finding GCF / HCF by prime factorizing

Examples

1. Find GCF of 12 and 18

2	12	18
3	6	9
	2	3

2 x 3 = 6

Therefore the GCF of 12 and 18 is 6

2. Find the GCF of 14 and 8

2	14	8
	7	4

Therefore the GCF of 14 and 8 = 2

3. Work out the HCF of 20 and 32

2	20	32
2	10	16
	5	8

2 x 2 = 4

Therefore The HCF of 20 and 32 = 4

Activity

Find the GCF of the following by prime factorizing

1. 4 and 12
2. 20 and 25
3. 20 and 30
4. 30 and 40
5. 36 and 48
6. 40 and 45
7. 15 and 18
8. 15 and 30

Topic : Number patterns and sequences

Subtopic : Finding LCM using multiples

Competences

Subject

The learner;

- Interprets the question given
- Finds the multiples
- State the common multiples
- Identifies the Lowest Common multiples

Content

Finding LCM using multipls

Examples

1. Find the lease common multiple of 4 and 3

   M_4 = (4, 8, 12, 16, 20, 24, 28, 32, ___)

   M_3 = (3, 6, 9, 12, 15, 18, 21, 24, ____)

   Com= (12, 24, ___)

   Therefore LCM of 4 and 3 = 12

2. Find the LCM of 12 and 18

   M_{12} = (12, 24, 36, 48, 60, 72, 84, ___)

   M_{18} = (36, 54, 72, 90, 108, 126, ____)

   Com= (36, ___)

   Therefore LCM of 12 and 18 = 36

3. Find the LCM of 8 and 16

   M_8 = (8, 16, 24, 32, 40, 48, 56, 64, ___)

   M_{16} = (16, 32, 48, 64, 80, ____)

   Com= (16, 32, 48, 64, ___)

   Therefore LCM of 8 and 16 = 16

Activity

Find the lowest common multiples of the following numbers

1. 10 and 20
2. 5 and 10
3. 15 and 30

4. 12 and 36
5. 12 and 15
6. 16 and 20
7. 60 and 45

Topic : Number patterns and sequences

Subtopic : Finding LCM using prime factors

Competences

Subject

The learner;

- Identifies the question given
- Arranges the numbers in rows
- Prime factorises

Content

Finding LCM using prime factors

Examples

1. Find the LCM of 12 and 18

2	12	18
2	6	9
3	3	9
3	1	3
	1	1

(2 x 2) x (3 x 3)

4 x 9

36

The LCM of 12 and 18 = 36

2. Find the LCM of 30 and 20

2	30	20
2	15	10
3	15	5
5	5	5
	1	1

(2 x 2) x (3 x 5)

4 x 15

1 5

x 4

6 0

The LCM of 30 and 20 = 60

Activity

Find the LCM of the following by prime factorizing

1. 4 and 12
2. 6 and 12
3. 12 and 15
4. 12 and 20
5. 15 and 30
6. 15 and 18
7. 40 and 45
8. 36 and 48

Topic : Number patterns and sequences

Subtopic : Prime factorizing numbers and representing them on the venn diagram

Competences

Subject

The learner;

- Interprets the quest given
- Prime factorises the numbers separately
- Writes prime factors in subscript form or set notation

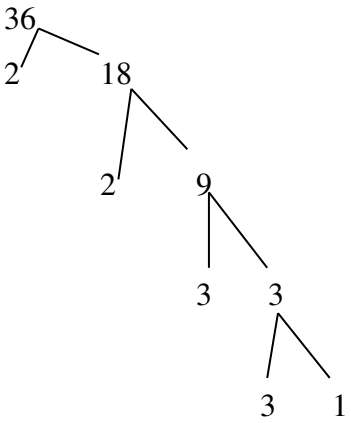
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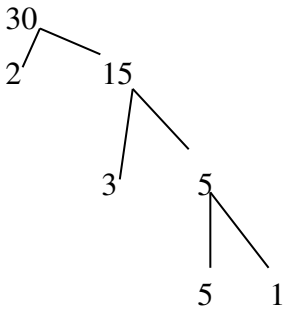
Prime factorizing numbers and representing them on a venn diagram

Examples

1. a) Prime factorize 36 and 30 separately

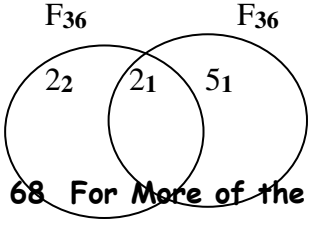
   b) Represent the prime factors on the venn diagram.





$F_{36}=(2_1, 2_2, 3_1, 3_2)$

$F_{30}=(2_1, 3_1, 3_2)$



 For More of the same work visit my website at https://emmaug.com

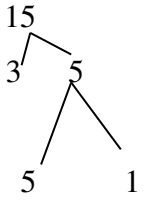
3_2 3_1

2. a) Prime factorize 12 and 15

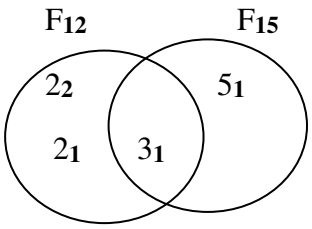
b) Represent the above information the venn diagram

2	12
2	6
3	3
	1

$F_{12}=(2_1, 2_2, \textcircled{3_1})$



$F_{15}=(\textcircled{3_1}, 5_1)$



Activity

Prime factorize the following and represent them on the venn diagrams

1. 12 and 20
2. 15 and 18
3. 20 and 30
4. 20 and 25
5. 8 and 16
6. 14 and 28
7. 30 and 40

Topic : Number patterns and sequences

Subtopic : Using a venn diagram to find LCM and GCF

Competences

Subject

The learner;

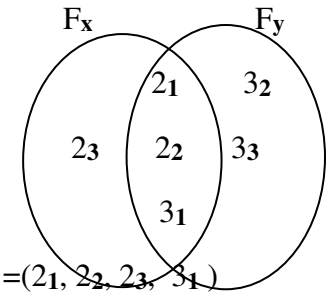
- Studies the venn diagram effectively
- Identifies where GCF lies and LCM
- Multiplies the prime factors to get LCM and GCF

Content

Using a venn diagram to find LCM and GCF

Examples

Find the value of x, y, GCF and LCM



$F_x = (2_1, 2_2, 2_3, 3_1)$

$= (2 \times 2) \times (2 \times 3)$

$= 4 \times 6$

$X = 24$

$F_y = (2_1, 2_2, 3_1, 3_2, , 3_3)$

$(2 \times 2) \times (3 \times 3) \times 3$

$4 \times 9 \times 3$

$y = 108$

$GCF = F_x \cap F_y$

$= (2_1, 2_2, 3_1)$

$= (2 \times 2) \times 3$

$= 4 \times 3$

$= 12$

Therefore GCF of x and y = 12

$LCM = F_x \cup F_y$

$= (2_1, 2_2, 3_1, 3_2, 3_3)$

$= (2 \times 2) \times (2 \times 3) \times (3 \times 3)$

$= (4 \times 6) \times 9$

$= 24$

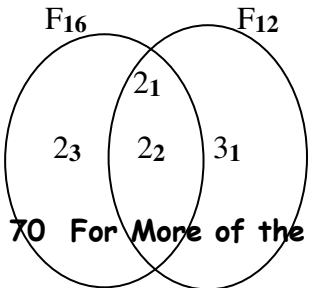
$\times 9$

216

Therefore LCM of x and y = 216

Activity

Study the venn diagram and answer the questions that follow



 For More of the same work visit my website at https://emmaug.com

2_4

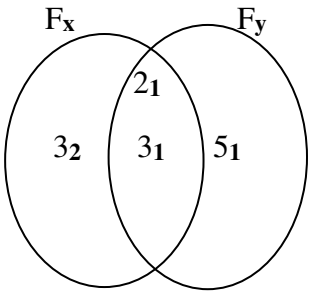
Find

i) $F_{16} \cap F_{12}$

ii) The GCF of 16 and 12

iii) $F_{16} \cup F_{12}$

iv) LCM of 16 and 12



Find

i) Find the value of x.

ii) Find the value of y.

iii) Find the GCF of x and y

iv) Find the LCM of x and y

Topic : Number patterns and sequences

Subtopic : Square numbers and square roots

Competences

Subject

The learner;

- Defines square numbers, square roots
- Prime factorizes to get the square root

Content

Square numbers and square roots

A square number is a number got by multiply accounting number by itself.

Counting number	Square root	Square number
1	1x1	1

2	2x2	4
3	3x3	9
4	4x4	16
5	5x5	25
6	6x6	36

Example

What is the square root of 16

2	16
2	8
2	4
2	2
	1

$\sqrt{2^2 \times 2^2}$

2×2

4

Therefore $\sqrt{16} = 4$

2. Find the square root of 64.

2	64
2	32
2	16
2	8
2	4
2	2
	1

$\sqrt{2^2 \times 2^2 \times 2^2}$

$(2 \times 2) \times 2$

4×2

8

$\sqrt{64} = 8$

Activity

A: Find the squares of the following

1. 6
2. 5
3. 4
4. 8
5. 9

B: Find the square root of the following

6. 9
7. 1
8. 81
9. 100
10. 144

Topic : Number patterns and sequences

Subtopic : Other types of numbers

Competences

Subject

The learner;

- Defines the types of numbers
- Identifies the types of numbers
- Identifies the types of numbers

Language

The learner;

- Reads , spells, writes and pronounces words such as Natural, counting, even, odd, triangular, composite.

Content

<u>Other types of numbers</u>

There are different types of numbers namely.

- Natural numbers
- Counting numbers
- Even numbers

- Odd numbers
- Triangular numbers
- Composite numbers

Natural numbers / counting numbers are numbers that begins from 1 to infinite

e.g 1, 2, 3, 4, 5, ___

Whole numbers are numbers with no fraction and begin with zero to infinite.

e.g. 0, 1, 2, 3, 4, ___

Even numbers are numbers that are exactly divisible by 2

e.g. 0, 2, 4, 6, 8, ___

Odd numbers are counting numbers that are not exactly divisible by 2

e.g. 1, 3, 5, 7, 9, ___

Prime numbers are numbers with only 2 factors 1 and itself

e.g. 2, 3, 5, 7, 11, 13, ___

Composite numbers are those with more than 2 factors

e.g. 4, 6, 8, 9, 10, ___

Square numbers are numbers got by multiplying accounting number by itself

e.g 1, 4, 9, 16, 25, ____

Activity

1. List all prime numbers less than 10.
2. Find the sum of composite numbers between 10 and 20
3. List all even numbers greater than 10 but less than 30
4. List odd numbers between 20 and 20
5. Find the sum of the 1^{st} and 15^{th} odd number

Topic : Number patterns and sequences

Subtopic : Finding the next number in the sequences

Competences

Subject

The learner;

- Defines the wind sequence
- Identifies the pattern used
- Fills in the next number in the sequence

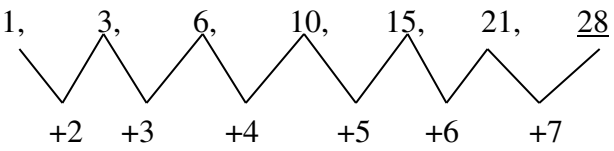
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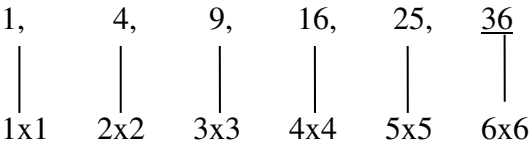
Finding the next number in the sequences

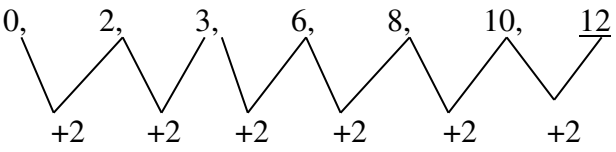
Examples

1. Find the next number in the sequence:

   1, 3, 6, 10, 15, 21, _____

2. 

3. 

4. 2, 3, 5, 7, 11 , 13 , 17 , (prime numbers)

5. Find the next number is the series 1, 3, 5, 7, _____

+2 +2 +2 +2 +2

Activity

1. Find the sum of the missing numbers

   1, 4, 9, ___, 25, 36, ____, 64.

2. Find the difference between the 2 missing numbers in the sequence :

   1, 3, 5, 7, 11, 13, 15, ___, 19, ____

3. Find the next number in the sequence:

   0, 2, 6, 12, 20, ___, ___, ___

4. 0, 2, 4, 6, 8, 10, ___., ___, ____

Topic : Fractions

Subtopic : Conversion in fraction (Mixed to improper and vice versa)

Competences

Subject

The learner;

- Identifies the question given
- Changes mixed numbers to improper fractions
- Changes improper fractions to mixed.

Content

Converting mixed numbers to improper and vice versa.

Examples

1. Change $\mathbf{4}\frac{2}{3}$ to improper fraction

   $\frac{(D \times W) + N}{D}$

   $\frac{(3x4) + 2}{3}$

   $\frac{12 + 2}{}$

3

$\frac{14}{3}$

2. Convert $\frac{17}{5}$ to a mixed number

$$\begin{array}{r} 03 \\ 5\overline{)\,1\;7} \\ 0\text{x}5 = \quad 0 \\ \quad\;\; 1\;7 \\ 3\text{x}5 = \quad -\;1\;5 \\ \quad\;\; (2) \end{array}$$

1 ÷ 5 = 0

17 ÷ 5 = 3

3 $\frac{2}{5}$

Activity

A: Convert the following improper fraction to mixed numbers

1. $\frac{7}{5}$ 2. $\frac{7}{2}$ 3. $\frac{10}{3}$ 4. $\frac{16}{3}$

5. $\frac{15}{5}$ 6. $\frac{21}{5}$ 7. $\frac{30}{7}$ 8. $\frac{50}{8}$

B: Convert the following mixed numbers to improper fractions

9. **1** $\frac{1}{2}$ 10. **2** $\frac{3}{4}$ 11. **4** $\frac{1}{5}$ 12. **5** $\frac{7}{11}$

Topic : Fractions

Subtopic : Equivalent fractions

Competences

Subject

The learner;

- Describes what an equivalent fraction is
- States the equivalent fractions of a given fraction

Language

The learner;

- Spells, pronounces and writes words such as equivalent.

Content

Equivalent fractions

Examples

1. Write the first 5 equivalent fractions of $\frac{3}{4}$

$$\frac{3}{4} = \frac{3x1}{4x1}, \frac{3x2}{4x2}, \frac{3x3}{4x3}, \frac{3x4}{4x4}, \frac{3x5}{4x5}, \frac{3x6}{4x6}$$

$$= \frac{6}{8}, \frac{9}{12}, \frac{12}{16}, \frac{15}{20}, \frac{18}{24}$$

2. Fill in the box $\frac{1}{2} = \frac{\square}{10}$

$$\frac{1}{2} = \frac{1x2}{2x2}, \frac{1x3}{2x3}, \frac{1x4}{2x4}, \frac{1x5}{2x6}, \frac{1x6}{2x6}, \frac{3x6}{4x6}$$

$$= \frac{2}{4}, \frac{3}{6}, \frac{4}{8}, \frac{5}{10}, \frac{6}{12}$$

Activity

A: List the first 5 equivalent fractions

1. $\frac{2}{5}$ 2. $\frac{3}{7}$ 3. $\frac{4}{7}$ 4. $\frac{3}{4}$

B: Fill in the blank space

5. $\frac{3}{5} = \frac{\square}{15}$ 6. $\frac{2}{7} = \frac{8}{\square}$ 7. $\frac{3}{4} = \frac{9}{\square}$ 8. $\frac{\square}{5} = \frac{8}{20}$

C: Find the unknowns below .

9. $\frac{3}{5} = \frac{x}{15}$ 10. $\frac{n}{4} = \frac{3}{12}$

Topic : Fractions

Subtopic : Reducing fractions

Competences

Subject

The learner;

- Describes what reducing a fraction is
- States the steps followed when reducing fractions

Content

Reducing fractions

Examples

1. Reduce $\frac{12}{24}$ to its lowest terms

$$\frac{12}{24} \quad \frac{6}{12} \quad \frac{3}{6} \quad \frac{1}{3}$$

$$\frac{6}{12} \quad \frac{2}{6} \quad \frac{1}{2}$$

2. Reduce $\frac{75}{100}$ to its lowest terms

$$\begin{array}{r} 3 \\ \cancel{15} \\ \cancel{75} \\ \hline \cancel{100} \\ \cancel{20} \\ 4 \end{array}$$

$$\frac{3}{4}$$

Activity

Reduce the following to their lowest forms

1. $\frac{2}{4}$
2. $\frac{3}{6}$
3. $\frac{12}{18}$
4. $\frac{18}{36}$
5. $\frac{45}{90}$
6. $\frac{24}{64}$
7. $\frac{30}{90}$
8. $\frac{25}{100}$
9. $\frac{54}{72}$
10. $\frac{18}{20}$

Topic : Fractions

Subtopic : Ordering fractions

Competences

Subject

The learner;

- States the LCM of the fractions
- Gets the value
- Arranges the fractions

Content

<u>Ordering fractions</u>

<u>Examples</u>

1. Arrange $\frac{3}{8}$, $\frac{7}{12}$ and $\frac{5}{8}$ in descending order

$\frac{3}{\cancel{8}} \times \frac{3}{\cancel{24}} = 3 \times 3$

$= 9$

$\frac{7}{\cancel{12}} \times \frac{2}{\cancel{24}} = 7 \times 2$

$= 14$

$\frac{5}{\cancel{8}} \times \frac{3}{\cancel{24}} = 5 \times 3$

$= 15$

$\frac{5}{8}, \quad \frac{7}{12}, \quad \frac{3}{8}$

2	8	12	8
2	4	6	4
2	2	3	2
3	1	3	1
	1	1	1

(2x2) x (2 x3)

4 x 6

24

2. Arrange $\frac{1}{3}$, $\frac{1}{2}$ and $\frac{1}{84}$ in ascending order

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

$= 4$

$\frac{1}{\cancel{2}} \times \frac{6}{\cancel{12}} = 1 \times 6$

$= 6$

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

$= 3$

$\frac{1}{4}, \quad \frac{1}{3}, \quad \frac{1}{2}$

2	3	2	4
2	3	1	2
3	3	1	1
	1	1	1

(2x2) x3

4 x 3

12

Activity

Arrange the following fractions in ascending order

1. $\frac{3}{4}, \quad \frac{2}{3}, \quad \frac{1}{2}$

2. $\frac{5}{6}, \quad \frac{5}{8}, \quad \frac{5}{12}$

3. $\frac{3}{4}, \quad \frac{2}{3}, \quad \frac{5}{6}$

4. $\frac{1}{2}, \quad \frac{1}{4}, \quad \frac{1}{8}$

Arrange the following fractions in descending order

5. $\frac{1}{2}, \quad \frac{1}{3}, \quad \frac{1}{4}, \quad \frac{1}{6}$

6. $\frac{4}{9}, \quad \frac{2}{3}, \quad \frac{5}{6}, \quad \frac{1}{2}$

7. $\frac{11}{12}, \quad \frac{13}{16}, \quad \frac{5}{6}, \quad \frac{3}{8}$

8. $\frac{1}{5}, \quad \frac{1}{2}, \quad \frac{1}{6}, \quad \frac{1}{3}$

Topic : Fractions

Subtopic : Addition of fractions

Competences

Subject

The learner;

- Finds the LCD
- Applies division, multiplication and addition when adding

Content

<u>Addition of fractions</u>

1. Add: $\frac{1}{4} + \frac{1}{2}$

$$\frac{(1x1) + (2x1)}{4}$$

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

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

	2	4	2
	2	2	1
		1	1

2 x 2

4

2. Add: $\mathbf{1}\frac{1}{2} + \mathbf{3}\frac{1}{4} + \frac{5}{6}$

$$\mathbf{1}\ \frac{+1}{x2} + \mathbf{3}\ \frac{+1}{x4} + \frac{5}{6}$$

LCD = 12

$$\frac{3}{2} + \frac{13}{4} + \frac{5}{6}$$

$$\frac{(6X3) + (3X13) + (2X5)}{12}$$

$$\frac{18 + 39 + 10}{12}$$

$$\frac{67}{12}$$

$$\mathbf{5}\frac{7}{12}$$

Activity

Add:

1. $\frac{1}{2} + 1$

2. $5 + 4\frac{2}{3}$

3. $2 + \frac{5}{8}$

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

5. $13\frac{1}{4} + \frac{1}{3}$

6. $\frac{1}{5} + \frac{7}{10} + \frac{3}{20}$

7. $1\frac{1}{6} + \frac{7}{15} + 1\frac{1}{3}$

8. $2\frac{1}{15} + 2\frac{3}{5} + 1\frac{3}{5}$

9. $\frac{5}{12} + \frac{3}{8} + \frac{7}{12}$

10. $1\frac{1}{2} + 2\frac{3}{4} + \frac{5}{8}$

11. $\frac{2}{5} + 9\frac{1}{6} + \frac{7}{30}$

12. John filled $\frac{1}{2}$ of a tank with water in the morning and $\frac{2}{5}$ in the afternoon. What fraction of the tank was filled with water?

13. Abdel had $1\frac{1}{2}$ cakes , Jane has $2\frac{3}{4}$ cakes and Rose had $\frac{3}{4}$ of a cake. How many cakes did the three children have?

14. $\frac{2}{3}$ of the seats in a bus are filled by adults and $\frac{1}{4}$ by children. What fraction of the seats in the bus is occupied?

15. A worker painted $3\frac{1}{9}$ wall on Monday and $\frac{4}{9}$ of a wall on Tuesday. How much was painted in the two days?

16. In a library $\frac{5}{15}$ of the books are mathematics books, $\frac{1}{6}$ are English books and $\frac{1}{32}$ are Science books. What fraction do the three groups represent?

Topic : Fractions

Subtopic : Subtraction of fractions

Competences

Subject

The learner;

- States the LCD of the denomination
- Subtracts fractions with different denominators

Language

The learner;

Content

<u>Subtraction of fractions</u>

<u>Examples</u>

1. Subtract : $5\frac{1}{4} - 2\frac{1}{2}$

$5\frac{+1}{x4} - 2\frac{+1}{x2}$

$\frac{21}{4} - \frac{5}{2}$ LCD

$\frac{(1x21) - (2x5)}{4}$

$\frac{21 - 10}{4}$

$\frac{11}{4}$ 2 r 3

$\mathbf{2}\frac{3}{4}$

2. A baby was given $\frac{5}{6}$ litres of milk and drunk $\frac{7}{12}$ litres. How much milk remained?

$\frac{5}{6} - \frac{7}{12}$

$\frac{(2 \times 5) - (1 \times 7)}{12}$ LCD = 12

$\frac{10 - 7}{12}$

$\frac{3}{12}$

$\frac{1}{4}$

Activity

A: Subtract the following fractions

1. $\frac{4}{5} - \frac{1}{5}$ 2 $2\frac{2}{5} - \frac{1}{2}$ 3 $3\frac{1}{2} - \frac{1}{4}$ 4. $\frac{3}{4} - \frac{1}{3}$ 5. $5\frac{1}{3} - 2\frac{1}{4}$

B:

6. $2\frac{1}{2}$ litres of water were removed from a container of $5\frac{1}{4}$ litres. How much water remained?

7. A girl has a $\frac{1}{2}$ glass full of water and used $\frac{1}{3}$ of it to take medicine. What fraction of water was left?

8. Ochili was given $\frac{3}{4}$ of a sugar cane. He gave $\frac{1}{6}$ of it to his friend . what fraction of the sugar cane did he remain with?

9. A basket is $\frac{7}{12}$ full of fruits. If $\frac{3}{6}$ of them are still green. What fraction of the fruits are ripe?

10. There we4re $12\frac{1}{4}$ bars of soap in a store. If $5\frac{7}{12}$ were used. How many remained?

Topic : Fractions

Subtopic : Mixed operations

Competences

Subject

The learner;

- Identifies various operation used
- Re-arranging the operations following BODMAS

Content

Mixed operations

Examples

1. Workout :

$\frac{5}{6} - \frac{5}{9} + \frac{7}{18}$ BODMAS

$\frac{5}{6} + \frac{7}{18} - \frac{5}{9}$

$\frac{(3x5) + (1x7) - (2x5)}{18}$

$\frac{15 + 7 - 10}{18}$

$\frac{22 - 10}{18}$

$\frac{12}{18}$

$\frac{2}{3}$

2	6	18	9
3	3	9	9
3	1	3	3
	1	1	1

2 x 3 x 3
6 x 3
18

2. Workout :

$7\frac{1}{2} - 3\frac{1}{4} + 1\frac{3}{12}$

$7\frac{+1}{x2} - 1\frac{+3}{x12} - 3\frac{+1}{x4}$

$\frac{15}{2} + \frac{15}{12} - \frac{13}{4}$

$\frac{(6x15) + (1x15) - (3x13)}{12}$

$\frac{105 - 39}{12}$

5 r 6

~~66~~
~~12~~
3

1

$5\frac{~~6~~}{~~12~~}$

2

$\mathbf{5}\frac{1}{2}$

2	2	12	4
2	1	6	2
3	1	3	1
	1	1	1

(2 x 2) x 3
4 x 3
12

Activity

1. $\frac{3}{4} + \frac{1}{5} - \frac{1}{2}$

2. $\frac{1}{2} + \frac{5}{6} - \frac{2}{3}$

3. $\frac{5}{12} + \frac{7}{12} - \frac{11}{12}$

4. $\frac{1}{2} + \frac{4}{5} - \frac{7}{10}$

5. $\frac{2}{3} + \frac{3}{5} - \frac{7}{15}$

6. $\frac{2}{3} - \frac{5}{6} + \frac{3}{4}$

7. $\frac{9}{20} - \frac{4}{5} + \frac{7}{10}$

8. $\frac{2}{3} + \frac{1}{9} - \frac{1}{3}$

9. $\frac{1}{4} - \frac{2}{4} + \frac{3}{4}$

10. $2\frac{1}{6} - 3\frac{1}{2} + 5$

Topic : Fractions

Subtopic : Multiplication of fractions

Competences

Subject

The learner;

- Multiplies top and bottom numbers directly
- Reduces the fractions where necessary

Content

Multiplication of fractions

Examples

1. Multiply:

   $\frac{1}{4}$ x 3

   $\frac{1}{4}$ x $\frac{3}{1}$

   $\frac{3}{4}$

2. Workout

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

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

   $\frac{1x1}{2x3}$

   $\frac{1}{6}$

Activity

1. $\frac{1}{3}$ x 3

2. $\frac{3}{7}$ x 14

3. $\frac{1}{12}$ x $\frac{1}{4}$

4. $\frac{1}{2}$ x $\frac{1}{4}$

5. $\frac{1}{6}$ x $\frac{1}{6}$

6. $\frac{1}{4}$ x $\frac{1}{4}$

7. $\frac{1}{12}$ x $\frac{1}{5}$

8. $\frac{1}{10}$ x $\frac{1}{3}$

Topic : Fractions

Subtopic : Application of fractions

Competences

Subject

The learner;

- Interprets the questions given
- Converts units
- Reduces were necessary

Content

Application of fractions

Examples

1. Simplify :

   $\frac{1}{2}$ of 16

   $\frac{1}{\cancel{2}}$ x $\cancel{16}^{8}$

   1

2. What is $\frac{1}{2}$ of 60 minutes

   $(\frac{1}{\cancel{4}}$ x $\cancel{60}^{15})$ minutes

   (1 x 15) minutes

1 x 8 **15 minutes**

8

3. What is $\frac{1}{7}$ of shs. 3500

500

$\frac{1}{7}$ x shs ~~3500~~

1

Shs. 500

Simplify

1. $\frac{1}{2}$ of 10
2. $\frac{1}{4}$ of 12
3. $\frac{1}{3}$ of 18
4. $\frac{2}{3}$ of 9
5. $2\frac{1}{4}$ of 16

What is

6. $\frac{1}{6}$ of 24kg
7. $\frac{2}{3}$ of 12km
8. $\frac{3}{4}$ of 280 grams
9. $\frac{3}{4}$ of shs. 400
10. $\frac{1}{5}$ of 30 litres

Topic : Fractions

Subtopic : More about application of fractions

Competences

Subject

The learner;

- Interprets the question

- Multiplies the question effectively

Content

More about application of fraction

Examples

1. A mother gave $\frac{1}{2}$ pancake to each of her 4 children. How many pancake did she have?

   Each got = $\frac{1}{2}$

   Total number of children = 4

   Pancakes = $\frac{1}{2}$ of 4

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

   2 pan cakes

2. Find the area of the figure below



12cm

Area = L x W

= 12cm x $6\frac{1}{2}$ cm

= 12cm x $\frac{13\text{cm}}{2}$

= 6cm x 13cm

Area = 78cm²

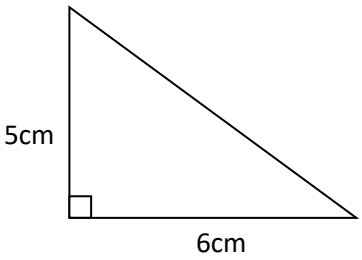
Activity

Find the area of the following

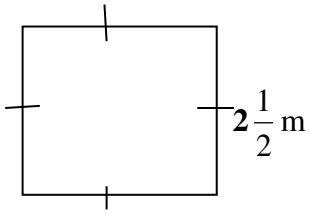
1.



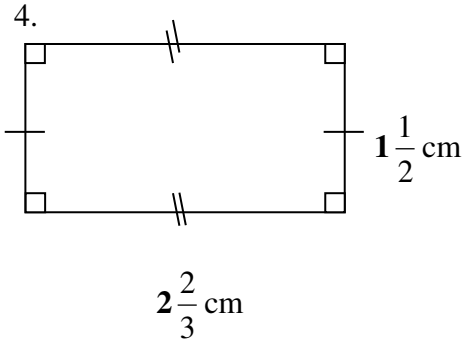
2.



3.



4.



5. A driver covered $\frac{1}{3}$ of her journey of 72km. what distance did she cover?

Topic : Fractions

Subtopic : Finding the reciprocal

Competences

Subject

The learner;

- Interpret the question given
- Defines the word reciprocal
- Finds the reciprocal of the number

Language

The learner;

-spells, pronounces and writes the words such as reciprocal, multiplicative inverse

Content

Finding the reciprocal

Examples

1. Find the reciprocal of $1\frac{1}{3}$.

   Let the reciprocal be m

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

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

   $\frac{4}{3}$ m = 1

$3x\ \frac{4}{3}$ m = 1 x 3

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

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

Therefore – the reciprocal of $1\frac{1}{3}$ is $\frac{4}{3}$

2. Find the reciprocal of $\frac{2}{7}$

   Let the reciprocal be n

   $\frac{2}{7}$ of n = 1

   $\frac{2}{7}$ x n = 1

   $\frac{2}{7}$ n = 1 x 7

$\frac{2}{2}n = \frac{7}{2}$

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

Therefore- the reciprocal of $\frac{2}{7}$ is $3\frac{1}{2}$

Activity

Find the reciprocal of the following

1. $\frac{1}{2}$ 2. $\frac{1}{3}$ 3. $\frac{5}{8}$

4. $\frac{7}{12}$ 5. 2 6. 20 7. $\frac{5}{6}$

Multiply each of these by its reciprocal

Topic : Fractions

Subtopic : Division of fractions

Competences

Subject

The learner;

- Interprets the question given
- Divides a whole number by a fraction
- Divides a fraction by a fraction
- Reduces where necessary

Content

Division of fractions

Examples

1. Divide : $2 \div \frac{1}{2}$

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

$\frac{4}{1}$

4

2. How many $\frac{1}{4}$ loaves of bread can be got from 2 loaves?

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

$\frac{4}{1}$ x $\frac{4}{1}$

$\frac{8}{1}$

$\frac{4}{1}$

8 quarter loaves of bread

Activity

Divide

1. $2 \div \frac{1}{3}$ 2. $3 \div \frac{1}{3}$ 3. $12 \div \frac{3}{4}$ 4. $3 \div \frac{3}{4}$

5. A teacher divided 12 pencils into halves.

6. How many $\frac{1}{3}$ chapattis can you get frim 2 whole chapattis?

7. How many bottles each $\frac{1}{4}$ a litre of milk can be filled from a jerrycan of 4 litres?

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Topic : Fractions

Subtopic : More about division of fractions

Competences

Subject

The learner;

- Identifies the question given
- Finds the reciprocal
- Reduces where necessa4ry

Content

More about division of fraction

Examples

1. Divide :

   $\frac{2}{3} \div 2$

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

   $\frac{2}{3} \div X \frac{1}{2}$

   $\frac{1x1}{3x1}$

   $\frac{1}{3}$

2. Divide :

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

$\frac{3}{4} \text{ x } \frac{2}{1}$

$\frac{3x1}{2x1}$

$\frac{8}{2}$

$1\frac{1}{2}$

3. How many ¼ litres bottles are contained in 10 ½ litres jerrycan?

$10\frac{+1}{x2} \div \frac{1}{4}$

$\frac{21}{2} \div \frac{1}{4}$

$\frac{21}{2} \div \frac{4}{1}$

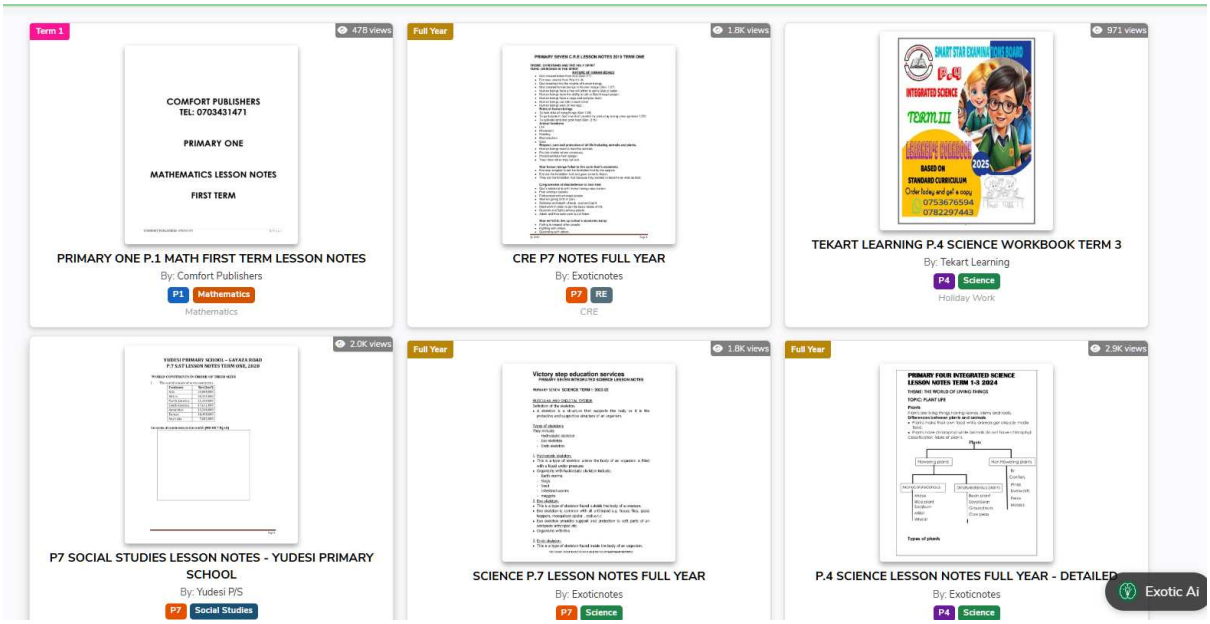
42 quarter liter bottles

Activity

$\frac{3}{4} \div 4$ $\quad$ $\frac{4}{5} \div 2$ $\quad$ $1\frac{1}{2} \div \frac{1}{4}$

$3\frac{1}{2} \div \frac{1}{5}$ $\quad$ $3\frac{1}{4} \div \frac{1}{8}$

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